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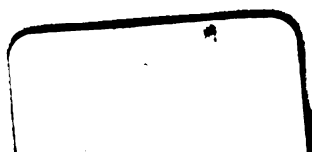
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JUN 20 1934

Geological Survey of New South Wales,

22 August, 1876.

To the Honorable John Lucas, M.P., Minister for Mines.

SIR,

By your direction I have recently inspected several of the principal gold fields, for the purpose of reporting as to the necessity for the reservation of certain Crown Lands from alienation. In reference to this matter, I have already reported on some of the districts visited. But apart from the special object of my mission, the geology of the country traversed has also engaged my attention; and I now do myself the honor to give you some general remarks on the result of my observations—deferring the more detailed descriptions of the rocks for my annual report.

The geological formations observed have an important bearing upon the future prospects of the Gold Fields of New South Wales, for, not only do they afford evidence of the permanency of these fields, but they testify also to the existence of extensive auriferous deposits which have not yet been developed.

The diggings hitherto opened are of comparatively small extent, and yet, with but few localities excepted, nearly the whole of the country which I have examined, from Goulburn to Adelong and Wagga Wagga; thence through Young, Grenfell, Forbes, Parkes, and Wellington to Gulgong; thence again to Bathurst and Cowra, a distance of some 750 miles, together with most of the intervening country (which I have not examined, but from which specimens of the rocks have been received), embracing an area of about 18,000 square miles,—which is about one-third of the known auriferous country of New South Wales,—is occupied by auriferous formations.

A large extent of this country certainly has been prospected by the miner, and proved to be not payable, but in many instances the prospects have been such as to encourage the belief that with cheaper labour and more efficient appliances for extracting gold than are now in use, considerable tracts of auriferous ground now abandoned, will, at some future time, be profitably worked.

As an instance, I may mention the Old Lambing Flat Diggings around Young.

It is a remarkable fact, and one which was long ago pointed out by the Rev. W. B. Clarke, M.A., F.R.S., F.G.S., &c., that the hornblende granites in this Colony are auriferous; and, with but few exceptions, I have noticed that on all the Gold Fields recently examined, hornblende granites and intrusive greenstone or diorite are the original source whence the gold found in the alluvial deposits has been derived. At Grenfell this is very marked. Here we have a large mass of porphyrite intruding Upper Silurian schists. Quartz reefs varying in thickness from that of a mere thread to over 10 feet, traverse the intrusive rock in a north-easterly direction, and in some instances pass into the adjoining schists; but though richly auriferous while in the former rocks,

they cease to be so immediately on entering the schists. Such was the case in the "Consols" quartz reef, and these features are characteristic of the other reefs at Grenfell. Numerous reefs occur in the schists, but though a little gold was found in some, as yet none of them proved payable. But I think that amongst them some exceptions may be discovered when properly prospected; for the "Evening Star" reef, about 7 miles from Grenfell, is in the schist rocks and has yielded over half an ounce of gold to the ton. As a general rule, however, the reefs in these Upper Silurian strata are not payably auriferous, and this fact is further confirmed by the evidence afforded by the alluvial deposits or "leads."

At the Grenfell, Forbes, Parkes, Burrandong, and Gulgong Gold Diggings, the leads are payably auriferous where they pass over dykes of granite and diorite traversing the schists, and the yield of gold gradually falls off on leaving the dykes. It is owing to this that many of the leads have been found "patchy," or richer in some places than in others. Seeing therefore that the gold has been chiefly derived from these greenstone trap dykes, it is of importance that the attention of the miners should be drawn to the fact when they are searching for auriferous quartz reefs. At Adelong, payable quartz has been obtained from a reef at a depth of 530 feet. This reef is in granite associated with diorite. At Grenfell, the "Consols" mine is 716 feet deep, the deepest in the Colony. The reef, however, which was over 10 feet wide on the surface, yielding up to 3 ozs. to the ton, began to fail below 500 feet; it is expected, however, that it has made on the south-east side, and that by cross-cutting in that direction it will be again struck.

There is a large intrusive mass of greenstone about 1 mile west of Grenfell, which has not yet been prospected. I would recommend miners to test its auriferous character. At Burrandong, there are some shallow alluvial diggings now abandoned, but which proved very rich*; here again is a mass of intrusive diorite and altered slates abounding in quartz reefs, which should command the attention of the prospector. These slates differ in lithological character from the Upper Silurian schists abovementioned and greatly resemble the Lower Silurian slates of Victoria; but I could not detect any fossils in them to verify their age. The "Mitchell's Creek" reef near Wellington is in diorite; the reef is from 2 to 4 feet wide, and a recent crushing of 440 tons of quartz is said to have averaged about $\frac{1}{2}$ oz. of gold to the ton. It contains sulphides of iron and copper. About 3 miles further to the north is "Fitty's" reef, also in diorite. In this promising reef, or rather reefs, for there are several of them, coarse specks of gold are sometimes found enclosed in green carbonate of copper. I believe that payable reefs occur in the line of greenstone formation which appears to have supplied the gold to the alluvial leads traversing the country between Forbes and Parkes; and from our inspection of the specimens of diorite lately collected by Mr. Warden Dalton from the country lying between the Lachlan and the Bogan, we can have little doubt but that there is a considerable tract of auriferous country yet to be developed extending for some 50 miles north-west from Parkes.

Quartz reefing in New South Wales may be considered in its infancy, and indeed the same remark will apply to alluvial mining; for hitherto the operations of the miners have been chiefly confined to the more shallow portions of the leads, which have been followed into the

* NOTE.—I am informed that 180 ounces of gold were obtained from one bucketful of a rich patch of wash-dirt.

deeper ground and there abandoned when the influx of water was too great for manual labour to cope with. On nearly all the alluvial diggings, as at Forbes, Parkes, Gulgong, and Grenfell, such has been the case ; and, doubtless, when once efficient machinery is introduced to work the wet ground in these localities, this class of gold-mining will soon become established on a permanent basis.

It is, of course, impossible to estimate the extent of such alluvial ground yet to be worked, but that it is very considerable I can confidently assert, from the geological evidence presented on our gold-fields. The auriferous alluvial leads or drifts are observed to belong to at least four distinct epochs ; those of the Upper Pliocene Tertiary formed the watercourses of a drainage system similar to that which now carries off the rain-water from the surface of the land. At that period the valleys were deeper than they now are, but owing to certain volcanic outbursts, molten lava flowed down into some of these valleys, burying in its course the river channels, and overwhelming the vegetation and animals that lived on the banks of those ancient streams. Climatic changes took place ; when the rocks and mountain slopes were disintegrated, and the denuded material—sand, mud, and pebbles—swept into the bottom of the valleys, still further filling them up with deposits, to be again eroded by unceasing atmospheric influences which have succeeded to our own day. Of all these we have abundant geological evidence. The strata passed through, as for instance in one single mining shaft at Gulgong, reveal for our perusal some of these pages in the book of Nature, which are beautifully illustrated by those* fossil leaves, fruit, and branches of large trees, and the fossil ferns which probably afforded shelter for the animals whose bones are also found entombed beneath that now solid lava which overwhelmed them. In the arrangement of the layers of the overlying sand, clay, and gravel, we see the effects of atmospheric forces the nature of which cannot be misunderstood. And thus from Earth's ancient history may be read lessons which the miner may make practical use of, if he will but avail himself of their valuable teaching to guide him in his search for the buried treasure.

Besides the auriferous resources of the districts above mentioned, extensive lodes of copper ores also occur. The recent rich discoveries at Coombing Park, Milbourne Creek, and near Borowa, confirm what was formerly anticipated from the surface indications. These, together with the Cow Flat, Wiseman's Creek, Carrangara, and other cupriferous localities in the Bathurst district, as well as the Goodrich, Belara, and the numerous occurrences of copper ores in the vicinity of Wellington, are indicative of the magnitude of the copper mining industry which these districts will at no distant day support.

In the Cudgegong and Macquarie River valleys there are considerable deposits of older Pliocene Tertiary drift. Apart from its stratigraphical position, its well-rounded water-worn character readily distinguishes it from the later Tertiary drifts. Wherever this older drift occurs, diamonds are found in some abundance. A company was once formed to mine for diamonds, and failed ; but its failure, like that of many gold-mining companies, may perhaps be attributed to other well-known causes than the absence of the precious gems or metals sought for. However,

* NOTE.—Remarkably fine specimens of these fossils, from a depth of 146 feet, in No. 23 Claim, Black Lead, at Gulgong, are now in the Museum of Mines.

diamonds are now frequently met with accidentally, in the process of washing for gold ; and, doubtless, many more pass away unnoticed with the quartz pebbles, the specific gravity of which (2·6) is so near that of the diamond (3·5).

The result of my recent examination of this country has convinced me that its mineral wealth is practically inexhaustible ; a large extent of the land is such as to offer every inducement to the agriculturalist ; and the only requirement now is population and capital, to take advantage of these great resources.

I have the honor to be, Sir,

Your obedient Servant,

C. S. WILKINSON, F.G.S.,

Government Geologist.

MINES AND MINERAL STATISTICS.

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ANNUAL REPORT

OF THE

DEPARTMENT OF MINES,

NEW SOUTH WALES,

FOR THE YEAR

1875.

SYDNEY: THOMAS RICHARDS, GOVERNMENT PRINTER.

1876.

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ANNUAL REPORT.

TO THE HONORABLE JOHN LUCAS, ESQ., MINISTER FOR MINES.

SIR,

In submitting the first Annual Report upon the Mines and Mineral Products of this Colony, I have the honor to state, that in order to ascertain the gold yield in this Colony for the past year, an attempt has been made to obtain from each party of miners and mining company a return of the quantities of gold won by them respectively. The Tables herewith show what measure of success has attended this first effort.

The result, considered apart from the difficulties of the undertaking, is by no means satisfactory; but when the enormous extent of territory over which our gold miners are spread, the isolated places in which many of them find employment, and the migratory habits of large numbers, especially of those who are scattered over the older fields are considered, and when it is taken into account that in some parts of the Colony gold-mining can be followed profitably only at certain seasons, that at other seasons the miners have to resort to other pursuits, and that in too many instances both miners and mining companies exhibit a strong disinclination to furnish information as to the result of their labors, it will, it is hoped, be conceded that the returns, though incomplete, are not discreditable, and give promise of future success, and that the officers charged with the collecting of such information are fairly entitled to commendation for the tact and industry displayed, and thanks for the zeal with which they as a rule have entered upon this new and useful branch of their duties.

It may, perhaps, be thought that such information can be more readily obtained from the Mint and Custom House, and if all the gold won in each year passed into the Mint or through the Custom House during that year, it must be admitted that no more satisfactory or simple means of procuring the information need be sought, but it is reasonable to suppose that under certain circumstances—such for example as a proposal to abolish the export duty on gold—large quantities may be hoarded up pending the settlement of the question, and thus some considerable portion of the gold won during one year be credited to the next. Complete returns from the miners would be a check upon the returns furnished by the Mint and Customs, and thus prevent misapprehension as to the quantity of gold actually raised during each year, and there is no reason why, with greater experience, the information collected by the officers of the Department should not become sufficiently accurate for that purpose.

The yield of gold in 1875, as represented by the returns kindly furnished by the Master of the Mint and the Collector of Customs, shows a decrease of 39940·81 ounces, as compared with the quantity for the year 1874, and a decrease of 111006·39 ounces as compared with the average annual yield since the gold discovery in 1851, but it is worthy of note that during 1875 only 3,897 ounces passed through the Custom House as compared with the quantity—37060·72 ounces—exported during 1874.

This extraordinary difference may be, and probably is, due to the fact that during the past year hopes were entertained by many that the export duty would be removed from gold; the Bill introduced for the purpose of effecting that object not having been rejected till the early part of February of this year.

It is certainly remarkable that so small a quantity should have been exported in 1875, seeing that the smallest quantity exported in any previous year since the gold discovery was 12329·55 ounces in 1857. The difference can scarcely be accounted for on the supposition that a large proportion of the gold usually exported was sent to the Mint, because the receipts of New South Wales gold at the Mint in 1875 are less than those for 1874 by 6231·09 ounces.

Most persons were perhaps prepared to find that the yield of our gold fields had fallen off, but it is thought few persons expected so great a decrease as is indicated.

Although our gold yield has not been so small since 1857, when it reached only 175,949 ounces, nevertheless the aggregate of the last five years exceeds the aggregate of the preceding five years by 302317·27 ounces.

It is somewhat curious that during the first decennial period of our gold fields the largest annual yield was obtained in 1852; during the second decennial period the largest annual yield was in 1862; and during the third decennial period (so far) the largest yield is that of 1872.

In spite of the uncertainty as to the quantity of gold won from our mines during the past year, it is almost certain that the yield has decreased to some extent, and therefore it may not be unprofitable to speculate as to the cause. The gold fields officers, whose opinions are worthy of great respect, for the most part ascribe it to the fact that large areas of auriferous land are locked up from the miner under application for lease, and to the depression succeeding the mania of 1872. That the delay in issuing Gold Leases has contributed, as well as the reaction which usually follows periods of intense excitement, to bring about the present unsatisfactory state of our gold mines cannot be gainsayed; but it is questionable whether much of the depression is not due to another cause, namely,—that the deposits already discovered have to a great extent been exhausted, as far as they are capable of being by the process known as digging, and that systematic mining, by which alone they can be further developed, has, with very few exceptions, not been introduced.

It is well known that there are extensive tracts of land, from which the miner unaided by capital cannot obtain a livelihood, which worked by the process known as hydraulic mining, would afford profitable employment to a large number of miners, and yield enormous returns of gold. There are other deposits which cannot be profitably worked without constructing expensive tail-races for the purpose of draining off the water. There are the strongest indications of the existence of deep alluvial leads, similar to those in Victoria, which cannot be profitably worked without the aid of machinery, and there are numerous gold bearing quartz veins and lodes which cannot be thoroughly tested without constructing extensive prospecting works, and cannot be rendered remunerative without the aid of labor-saving and gold-saving appliances.

It is generally admitted that such deposits as can be profitably worked without the aid of capital should not be monopolised by capitalists and speculators; and if it were generally recognised that it is desirable to encourage the investment of capital in mine works which cannot be carried on profitably without its aid, an important step towards the development of our auriferous resources will have been taken.

It clearly is not in the interest of the miner that deposits which he cannot work should be shut up from the capitalist, because the working of such deposits will provide employment for his labor, as it will afford profitable investment for capital, and thus both classes will be benefitted.

Professor Liversidge has tested forty-seven parcels of quartz tailings from various parts of the Colony, and the results obtained by him show that these tailings contain an average of 6 dwts. 17·6 grains of gold per ton.

In one of the tables is given the yield of gold from sundry parcels of quartz from various parts of the Colony. These parcels weigh in the aggregate 10,609 tons, and give an average yield of gold equal to 1 oz. 4 dwts. 4·1 grains per ton. And as each ton of quartz crushed will produce say 1 ton of tailings, it will be seen that 21·8 per centum of the gold contained in our quartz is carried off in the waste.

This loss which will in many instances represent the difference between a remunerative and a non-remunerative mine, points to the necessity for the employment of greater care or greater skill, and perhaps in most cases superior appliances. It may be that with the greatest care and skill, and the best appliances procurable, the whole of the gold could not profitably be saved, but at any rate the loss may be very considerably reduced, and where the skill and appliances are wanting the tailings might be saved for sale or future treatment.

Assuming that 1 oz. 4 dwts. 4·1 grs. represents correctly the average yield of gold per ton, nearly sixty thousand tons of quartz must have been crushed during 1875, and assuming that each ton of quartz crushed produces one ton of tailings, and that each ton of tailings contains 6 dwts. 17·6 grs. of gold, the quantity of gold lost in 1875 alone will be 20,200 ounces.

Professor Liversidge in his report remarks the absence of pyrites from the sample of tailings submitted to him, and says, "The tailings yet collected and reported upon are for the most part non-pyritous, hence their thorough and effective treatment should be comparatively easy and free from expense, and a properly conducted and well advised attempt to recover the gold thus lost should prove a most profitable enterprise."

This absence of pyrites is somewhat surprising, seeing that as a rule the quartz veins of this Colony are heavily charged with pyrites, and it may perhaps be accounted for by the supposition that the samples submitted were taken from the tops or surface of waste-heaps which have been for a long time exposed, and if this be true, it may be found that our waste contains a much larger percentage of the gold than is revealed by the examination of the samples submitted. As evidence of the value of some of our pyrites, Professor Liversidge finds that one sample contains gold equal to 218 oz. 10 dwts. 19 grs. per ton, while a company in the Orange Division has had some parcels tested, one of which was found to contain more than 300 ounces of gold per ton.

From the Bathurst, Mudgee, and Lachlan Districts respectively, returns have been obtained showing that 58,081 tons of wash-dirt give an average yield of 5 dwts. 9·58 grs. of gold per ton. Now it is almost certain that as a rule, especially in localities where water is scarce, a considerable quantity of fine gold is carried off in the sludge from the puddling machines, and had an attempt to collect samples from all the gold-fields been successful, some idea of extent of our own loss in this way might have been formed, though it would not have been easy to ascertain what proportion of the gold is lost, because of the difficulty of determining what quantity of wash-dirt is represented by a ton of sludge.

As it is, only six samples, chiefly from the Western Gold Fields, have been tested, and they contain an average of 2 dwts. 21·66 grs. per ton. In view of this fact it is hoped the owners of puddling machines will store the sludge and send samples thereof to this Department for examination, so that the gold may be recovered from such of it as will pay for further treatment.

Assuming that the Mint and Customs returns represent the quantity of gold raised in this Colony during the year 1875, it is equal to 14 oz. 16 dwts. 20·62 grs. for each miner employed, while the quantity of gold won in Victoria during the same period is equal to 25 oz. 8 dwts. 1·18 grs. for each miner, the difference would not be so great but that the gold extracted from the waste is included in the Victorian yield, whereas the waste in this Colony is not treated. The difference may to some extent be due to a practice which obtains in some parts of this colony of transmitting parcels of gold by post; it cannot with certainty be said that any of this gold passes into Victoria and is there treated as Victorian gold, but it is quite possible, and in view of the export duty not quite improbable, that some of our gold does pass out of the Colony in that manner. The difference clearly cannot be accounted for by comparing the average yield of the two Colonies, seeing the report for the last quarter of 1875 gives the Victorian averages as follows:—quartz, 11 dwts. 18·19 grs. per ton; tailings and mullock, 3 dwts. 9·49 grs. per ton; pyrites and blanketings, 2 oz. 10 dwts. 12·23 grs. per ton; and wash-dirt 23·58 grs. per ton; showing that our quartz is twice as rich, that our tailings are nearly twice as rich, that our wash-dirt is five times as rich, and that our sludge contains nearly three times as much gold as the Victorian wash-dirt.

In Victoria the alluvial deposits are perhaps more extensive, and the quartz lodes as a rule are larger and more easily worked than those yet opened up in this Colony, added to which the modes of working and the labor-saving appliances employed there enable a given number of miners to raise and treat a much greater quantity of earth in a given time than can be done on our gold-fields.

The estimated value of the plant used in connection with gold mining in Victoria exceeds two millions, while in this Colony according to the returns it does not reach one quarter of a million.

There is no reason to doubt that with improved methods of working and suitable appliances our gold fields would be more productive, a greater number of miners would be attracted to and find employment upon them, and the gold yield of this Colony would largely increase.

The quantity of coal raised in 1875 so far as can be ascertained, is less than in 1874 by 51,094 tons, but the return is not quite complete. The decrease may be accounted for by the fact that during part of the year work was suspended at some of the collieries, and that the output at the Southern and Western Mines was considerably less than during the previous year. The quantity raised at some of the more recently opened collieries has however considerably increased.

The quantity of shale raised at the Mount Kembla Mine could not be ascertained, but the whole of it was converted into oil, making about 39,000 gallons, including refined, lubricating, and wood preserving oils. Sixty men were employed during part of the year, but the works have now been stopped for the purpose of raising additional capital. In the absence of a return showing the quantity of shale raised in this mine, no comparison between the total yield of 1874 and 1875 can be instituted.

In consequence of the incomplete returns obtained from the mines of the quantities of minerals, other than gold and coal, won during the year 1875, the figures kindly furnished by the Collector of Customs have been adopted, though they are by no means satisfactory, owing to the difficulty of ascertaining whether the whole of the mineral is the produce of this Colony.

The value of tin exported during 1875, exceeds the value for 1874 by £76,989.

The value of copper exported in 1875, exceeds the value in 1874 by £197,259.

The value of silver exported in 1875 is not so great as that in 1874 by £6,068.

The value of antimony (*Regulus*) exported in 1875, exceeds that of 1874, by £4,878.

Though iron is not mentioned in the table of mineral products in this report, there is every reason to believe that in future it will form an important item of our mineral products, as both the Fitzroy and Lithgow Valley Mines are now apparently in good working order.

Notwithstanding the falling off in the gold yield, it will be seen by comparing the returns for the two years, that the value of our mineral products (including gold) in 1875 exceeds the value thereof in 1874 by £85,314 15s. 8d., while the value of our mineral products (exclusive of gold) in 1875, exceeds that of 1874 by £247,949 11s. 2d. And it is gratifying to find that as a rule we now export metals instead of ores.

Reference to Professor Liversidge's report (hereto annexed) on the samples of auriferous and argentiferous copper ores shows that some of our copper lodes are very rich in gold and silver. (Sample No. 32 in Part I of the Report being red oxide of copper contains gold equal to 14 ozs. 10 dwts. 6 grs. per ton), and points to the necessity for the erection of works for the treatment of such ores, so as to separate and save all the metals. If this were done not only would many of our lodes now neglected be worked with profit, but our yield of gold and silver would be largely increased. With greater facilities for the shipment of coal, and for bringing our ores of tin and copper to smelting works at a moderate cost, there is reason to believe that our yield will steadily increase from year to year, and as our iron mines become developed the aggregate value of our mineral products will far exceed that of past years.

I have, &c.,

HARRIE WOOD.

SUMMARY.

	Total No. of Miners.	Value of Plant.		
		£	s.	d.
Gold mines in 1875	15,555	224,017	0	0
Coal and Shale do.	3,348	376,820	0	0
Copper do.	633	4,000	0	0
Tin do.	1,472	2,500	0	0
Total.....	21,008	607,337	0	0

Number of square miles of alluvial ground worked to date..... 2,716
Do. quartz reefs proved to be auriferous to date 488

	Quantity.	Value.	Total Value.	
		£ s. d.	£	s. d.
Quantity and value of gold raised prior to 1st January, 1875	8,205,232 ozs.	30,536,246 10 6		
Quantity and value of gold raised during the year 1875	230,882'50 "	877,693 18 0		
Totals	8,436,114'50 "	31,413,940 8 6	31,413,940	8 6
Quantity and value of silver raised prior to 1st January, 1875	281,238 ozs. 11 dwts.	77,216 0 0		
Quantity and value of silver raised during the year 1875	52,553 " 0 "	12,794 0 0		
Totals	333,791 " 11 "	90,010 0 0	90,010	2 0
Quantity and value of coal raised prior to 1st January, 1875	12,387,279 tons.	6,655,328 0 0		
Quantity and value of coal raised during the year 1875	1,253,475 "	765,133 11 2		
Totals.....	13,640,754 "	7,420,461 11 2	7,420,461	11 2
Quantity and value of copper raised prior to 1st January, 1875	Ingots—6,828 tons }	807,476 0 0		
Quantity and value of copper raised during the year 1875	Ore—21,897½ " }	508,778 0 0		
	Ingots—5,991 " }			
	Ore—254 " }			
Quantity and value of tin raised prior to 1st January, 1875	Ingots—5,052 " }	866,461 0 0		
Quantity and value of tin raised during the year 1875	Ore— 6,601 " }	561,311 0 0		
	Ingots—6,058 " }			
	Ore— 2,022 " }			
Value of iron raised prior to 1st January, 1875 .....	.....	15,434 0 0		
Quantity of iron raised during the year 1875	40 tons.	502 0 0		
Quantity and value of antimony raised prior to 1st January, 1875	Ore—72 tons.	897 0 0		
Quantity and value of antimony raised during the year 1875	Regulus 142 tons.	5,000 0 0		
			5,897	0 0
			41,690,270	19 8

TABLE showing approximately the number of Miners employed in Gold Mining, the quantity of Gold won, the area of ground worked, and the value of Machinery in the Colony of New South Wales, during the year 1875.

District and Division.	Alluvial Miners.		Quartz Miners.		Total Miners.	Quantity of Gold.			Price of Gold per ounce.		Value of Gold won.	Alluvial ground worked.	Quartz Reefs proved to be auriferous.	Value of Machinery
	Euro-peans.	Chinese.	Euro-peans.	Chinese.		Alluvial.	Quartz.	Total.	From.	To.				
No.	No.	No.	No.	No.	ozs.	ozs.	ozs.	s./d.	s./d.	£ s. d.	Square miles.	No.	£	
BATHURST DISTRICT—														
Bathurst Division.....	23	45	20	20	108	60	225	285	70/0	75/0	1,033 2 6	...	8	.....
Trunkley ".....	100	17	68	...	185	1,013	811	1,824	74/0	...	6,748 16 0	...	9	17,000
Tuena ".....	60	55	...	...	115	620	600	1,220	72/6	75/6	4,477 19 0	20	15	6,150
Carcara ".....	150	25	100	...	275	1,737	2,522	4,259	65/0	78/0	9,709 13 6	...	...	.....
Cowra ".....	12	...	...	...	12	.....	43	43	70/0	77/0	164 9 6	1	...	.....
Oberon ".....	7	...	26	...	33	178	343	521	70/0	...	1,823 10 0	4	5	1,800
Rockley ".....	35	49	10	...	94	1,868	950	2,818	72/0	...	10,144 16 0	7	3	3,500
Orange ".....	6	70	...	20	96	3,643	3,681	7,324	55/0	77/0	24,169 4 0	...	10	6,420
Mitchell's Creek Division	18	21	15	...	54	350	480	830	45/0	74/0	2,420 12 6	150	6	.....
TAMBARORA AND TURON DISTRICT—														
Hill End Division.....	120	135	464	27	746	5,726	28,580	34,306	75/0	82/0	134,060 16 2	50	40	17,095
Sofala ".....	68	1	...	...	69	2,979	5,031	8,010	73/6	74/6	29,637 0 0	900	...	.....
Ironbarks ".....	237	70	74	...	381	1,948	1,580	3,528	70/0	76/6	12,833 2 0	80	22	3,570
MUDGEES DISTRICT—														
Gulgong Division.....	499	26	172	...	697	29,204	2,869	32,073	70/0	77/6	121,078 0 9	9	7	9,940
Mudgee ".....	60	30	48	...	138	1,054	165	1,219	69/0	70/0	4,350 7 0	20	2	2,400
Hargraves ".....	170	204	...	...	374	2,067	...	2,067	72/0	76/0	7,654 4 9	40	10	2,800
Wellington ".....	...	15	58	...	73	40	625	665	75/0	...	2,493 10 0	...	2	11,000
LACHLAN DISTRICT—														
Forbes Division.....	139	...	56	...	195	558	242	800	68/6	72/6	2,817 10 0	120	20	2,500
Parkes ".....	2,700	10	88	...	2,798	66,056	550	66,606	74/0	77/0	241,102 0 0	140	30	16,800
M'Guigan's " (Sub)...	5,000	...	50	...	5,050	9,439	...	9,439	74/6	76/6	35,596 5 0	182	17	4,000
Cargo ".....	60	...	60	...	120	1,450	1,750	3,200	74/0	...	11,840 0 0	...	2	1,800
Grenfell ".....	53	...	40	...	93	829	1,252	2,081	70/0	76/0	7,599 0 0	25	22	9,410
Young ".....	143	78	...	...	221	1,548	...	1,548	76/0	...	5,882 8 0	...	2	1,800
SOUTHERN DISTRICT—														
Braidwood Division.....	130	35	...	...	165	483	...	483	70/0	77/0	1,813 10 0	10	...	20,000
Arden Division.....	246	91	6	...	343	188	109	297	68/0	75/9	1,085 4 7	...	30	7,440
Major's Creek Division..	120	100	21	...	241	2,672	140	2,812	70/0	74/3	10,423 12 0	20	15	2,030

TABLE showing approximately the number of Miners, &c.—continued.

District and Division.	Alluvial Miners.		Quartz Miners.		Total Miners.	Quantity of Gold.			Price of Gold per ounce.		Value of Gold won.		Alluvial Ground worked.	Quartz Beefs proved to be auriferous.	Value of Machinery.
	Euro-peans.	Chinese.	Euro-peans.	Chinese.		Alluvial.	Quartz.	Total.	From.	To.	£	s. d.			
SOUTHERN DISTRICT—continued.															
Little River Division	157	150	5	...	312	2,150	21	2,171	76/0	...	8,310	10 0	...	42	7,170
Nerrigundah	58	52	10	...	120	1,341	47	1,388	78/6	...	5,447	18 0	3	6	1,420
Shoalhaven	27	...	...	...	27	...	...	...	...	...	...	...	...	...	472
Nerrinunga	30	...	...	...	30	...	...	...	...	...	...	...	...	...	...
Moruya	12	...	...	...	12	18	...	18	77/0	78/0	70 9 7	...	...	...	...
Bombala	12	300	...	...	312	...	...	...	...	...	...	...	...	...	...
TUMUT AND ADELONG DISTRICT—															
Adelong Division.....	105	...	223	12	340	3,500	8,938	12,438	60/0	80/0	45,975	0 0	10	10	11,800
Reedy Flat	...	...	...	...	...	1,793	...	1,793	60/0	80/0	6,275	10 0	...	...	...
Tumut	61	21	2	...	84	1,001	...	1,001	74/6	75/0	4,198	0 0	156	17	2,500
Gundagai	10	...	20	...	30	22	...	22	75/0	...	82	10 0	...	...	3,000
Yass	...	...	8	...	8	...	5	5	70/0	75/0	18 2 6	6	6	8	1,500
Tumbarumba Division...	220	43	56	...	319	2,061	1,077	3,138	45/0	76/0	10,994	0 0	25	10	10,300
Kiandra	80	81	...	...	161	1,157	...	1,157	70/0	72/0	3,707	0 0	30	6	7,500
Ten-mile Creek	...	...	42	...	42	...	1,100	1,100	78/0	80/0	4,436	0 0	...	...	...
Albury	7	12	20	...	39	...	18	18	75/0	77/0	41 5 0	...	...	...	50
PEEL AND URALLA DISTRICT—															
Armidale Division	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Uralla	95	40	...	...	135	1,114	...	1,114	75/6	...	4,205	7 0	20	...	300
Nundle	60	70	23	...	153	1,000	833	1,833	72/6	73/6	6,667	10 9	...	...	7,600
Scone	2	...	18	...	20	...	112	112	63/0	72/0	365	0 0	...	...	2,000
Barraba	23	1	20	...	44	250	361	611	66/0	71/0	2,049	10 0	20	8	1,390
Bingers	20	10	...	...	30	...	...	...	...	...	...	...	40	2	650
NEW ENGLAND AND CLARKE DISTRICT—															
Tenterfield Division.....	251	60	5	...	316	...	...	...	...	...	...	...	...	5	2,550
Little River	5	...	4	...	9	26	117	143	75/0	...	536	5 0	308	64	7,000
Lunatic	200	50	23	...	273	961	222	1,183	68/0	71/0	3,862	18 6	300	12	1,600
Sollerino	21	4	31	...	56	251	286	537	65/0	72/0	1,834	0 0	20	21	7,760
Ballina	7	...	...	...	7	...	...	...	...	...	...	...	...	...	...
Totals	11,619	1,971	1,886	79	15,555	152,415	65,694	218,109	...	...	800,035	9 7	2,716	488	224,017

TABLE showing approximately the number of Miners employed in mining for Minerals other than Gold, the quantity of such Minerals won, during the year 1875, and the value of the same, and Plant.

Name of Company.	Locality.	Miners employed.	Quantities.			Value.	Value of Machinery.	Remarks.
			Coal.	Copper.	Tin.			
		No.	tons.	tons.	tons.	£ s. d.	£	
Australian Agricultural ...	Newcastle	706	224,204	143,862 4 2	The quantities won during the last quarter of the year at the collieries marked thus * have been estimated from previous returns.
Waratah	"	251	162,531	...	...	98,459 4 0	100,000
Newcastle Wallsend	"	680	217,734	...	...	141,830 10 0	.....
Co-operative	"	230	183,487	...	...	115,348 0 0	87,000
Lambton	"	280	148,573	...	...	94,096 4 8	.....
*New Lambton	"	252	97,968	...	...	61,856 8 0	.....
*Duchenfield	"	115	37,582	...	...	23,801 18 8	.....
Victoria Tunnel	"	8	2,658	...	...	1,153 10 0	.....
Glen Rock	"	8	382	...	...	167 2 0	.....
Pearse & Co.	Four-mile Creek	14	12,077	...	...	3,119 17 10	400
†Jugansee	"	The quantities of coal raised at the collieries marked thus † not known.
Sunderland	"	3	800	...	...	320 0 0	.....
Bloomfield	"	3	1,201	...	...	337 1 0	80
Jeemond	"	2	150	...	...	75 0 0	10
Greta Coal and Shale	Maitland	120	37,410	...	...	21,510 15 0	40,000
*Anvil Creek	"	64	27,581	...	...	19,076 19 4	.....
Stoney Creek	"	3	1,201	...	...	337 1 0	80
Rir's Creek	Singleton	2	560	...	...	372 0 0	250
New Wallsend	Oatherine Hill Bay	70	4,380	...	...	3,066 0 0	7,800
Bull	Illawarra	178	26,250	...	...	10,500 0 0	61,400
Mount Pleasant	"	122	26,720	...	...	10,476 1 0	20,000
Osborne Wallsend	"	130	21,081	...	...	8,682 19 0	40,000
†Mount Kembla	Wollongong	.....	.....	.....	.....	.....	5,100
Lithgow Valley	Hartley	21	4,716	...	...	2,358 0 0	.....
Eah Creek	"	14	6,285	...	...	1,622 9 6	1,500
Bowenfalls	"	8	2,984	...	...	1,193 12 0	4,700
Vale of Clydd	"	21	4,467	...	...	1,326 16 0	8,000
Bulkeley's	Wallerawang	3	613	...	...	183 18 0	500
Totals	Totals	3,308	1,253,475	765,133 11 2	376,820	

TABLE showing approximately the number of Miners, &c.—continued.

Name of Company.	Locality.	Miners employed.	Quantities.			Value.	Value of Machinery.	Remarks.
			Coal.	Copper.	Tin.			
New South Wales Shale and Oil	Newcastle	No. SHALE. 40	tons. 5,492	tons. ...	tons. ...	£ s. d. £ 13,730 0 0	£	
	Bathurst	COPPER. 95	.....	28	...	2,352 0 0	.....	Ore
	Tuena	150	.....	193	...	21,220 0 0	2,000	"
	Rockley	12	.....	60	...	160 0 0	.....	"
	Oberon	19	.....	466	...	2,876 5 3	.....	"
	Carcoar	50	.....	124	...	2,455 0 0	.....	"
	Orange	128	.....	383	...	1,915 0 0	.....	"
	Gulgong	5	.....	...	...	.....	.....	"
	Burrows	15	.....	200	...	992 0 0	.....
	Grafton	9	.....	30	...	427 10 0	.....
	Totals	483	.....	1,484	...	32,397 15 3	2,000	
	Cope's Creek, Tingha	TIN. 477	.....	...	1,574	51,942 0 0	.....
	Inverell	42	.....	...	100	3,600 0 0	.....
	Vegetable Creek	607	.....	...	3,040	97,280 0 0	2,500	
	Tenterfield	334	.....	...	1,560	62,400 0 0	.....
	Tumbarumba	12	.....	...	134	6,700 0 0	.....
	Totals	1,472	.....	...	6,408	221,922 0 0	2,500	

ESTIMATED YIELD OF GOLD IN NEW SOUTH WALES FOR THE YEAR 1875.

QUANTITY of Gold the produce of New South Wales received at the Royal Mint, Sydney, during the year 1875.

Rough Gold.	Gold Bullion.	Total.
OZS. 157,019'87	OZS. 69,965'63	OZS. 226,985'50

QUANTITY of Gold Exported during the year 1875.

Dust.		Bars.		Total.		Coin.	
Ozs.	Value.	Ozs.	Value.	Ozs.	Value.	Ozs.	Value.
1,731	£ 6,319	2,166	£ 8,830	3,897	£ 15,149	461	£ 2,085,241

QUANTITY of Gold purchased by the Banks, Gold Buyers, and others, during the year 1875, as shown by the Returns furnished.

Mixed.			Alluvial.			Quartz.			Total.		
oz.	dwts.	grs.	oz.	dwts.	grs.	oz.	dwts.	grs.	oz.	dwts.	grs.
100,530	6	3	4,543	18	18	2,339	17	2	107,414	1	23

QUANTITY of Gold won during the year 1875, as shown by the Returns from the Mines furnished by the Mining Registrars.

Alluvial.			Quartz.			Total.		
oz.	dwts.	grs.	oz.	dwts.	grs.	oz.	dwts.	grs.
152,415	0	0	65,694	0	0	218,109	0	0

COMPARATIVE Statement of Gold for 1875.

Mint and Export Return.			Banks and Gold Buyers Return.			Returns from Mines.		
oz.	dwts.	grs.	oz.	dwts.	grs.	oz.	dwts.	grs.
230,882	10	0	107,414	1	23	218,109	0	0

The quantity purchased by the Banks is less by 123,468 8 1
than the quantity sent to the Mint and exported.

The quantity won from the mines, as shown by the Mining Registrar's Reports, is less than
the quantity sent to the Mint and exported by 12,773 10 0

STATEMENT of the Gross Weight of Gold received at, and issued from, the Royal Mint, during the year 1875.

Received.		Issued.	
Rough Gold.	Gold Bullion.	Weight of Gold Coin.	Weight of Gold Bullion.
OZS. 245,507'14	OZS. 291,977'54	OZS. 545,002'930	OZS. 1,673'786

QUANTITY of Coal exported during the year 1875.

Tons.	Value.
926,292	£ 671,977

QUANTITY of Copper exported during the year 1875.

Ingots.		Ore.		Totals.	
Tons.	Value.	Tons.	Value.	Tons.	Value.
5,991	£ 501,287	254	£ 7,491	6,245	£ 508,778

QUANTITY of Tin exported during the year 1875.

Ingots.		Ore.		Totals.	
Tons.	Value.	Tons.	Value.	Tons.	Value.
6,058	£ 475,168	2,022	£ 86,143	8,080	£ 561,311

Quantity of Iron exported during the year 1875.

Tons.	Value.
40	£502

Quantity of Silver exported during the year 1875.

Ounces.	Value.
52,553	£12,794

Quantity of Antimony exported during the year 1875.

Regulus—tons.	Value.
142	£5,000

SUMMARY.

QUANTITY of Gold obtained from certain parcels of wash-dirt which have been puddled, sluiced, or crushed during the year 1875, showing the average yield of Gold per ton.

Mining District.	Wash-dirt puddled, &c.			Average yield per ton.			Total yield of Gold.		
	tons.	cwt.	qrs.	ozs.	dwts.	grs.	ozs.	dwts.	grs.
Bathurst	105	0	0	0	8	22·85	47	0	0
Mudgee	53,289	0	0	0	5	6·71	14,067	15	22
Lachlan	4,687	0	0	0	6	16·29	1,565	5	0
Totals.....	58,081	0	0	0	5	9·58	15,680	0	22

The following information has been obtained by the Wardens and Mining Registrars respecting certain parcels of Wash-dirt which have been puddled, sluiced, or crushed, during the year 1875, and the quantity of the Gold produced therefrom.

District and Division.	Name of Company.	Locality.	Quantity.	Average yield of Gold per ton.	Total yield of Gold.	Depth of Workings.
BATHURST DISTRICT— Oberon Division	Joseline & Co.	Brisbane Valley	tons. cwt. grs. 25 0 0	ozs. dwt. grs. 0 5 14.4	ozs. dwt. grs. 7 0 0	feet 10
	Orange do	Osborne's Paddock ..	80 0 0	0 10 0	40 0 0	80
		Total	105 0 0	0 8 22.85	47 0 0	
MUNGERE DISTRICT— Gulgong Division	Prospecting Co.	Canadian Lead	20,000	0 6 0	6,000 0 0	average
	No. 1 North	"	3,500	0 8 0	1,400 0 0	120
	" 2	"	2,000	0 5 0	500 0 0	"
	No. 1 Paula	"	6,000	0 8 0	2,400 0 0	"
	" 2	"	8,000	0 8 0	3,200 0 0	"
	" 3	"	2,000	0 4 0	400 0 0	"
	Wakelin	Hargraves	443	0 0 8.97	8 5 18	surface
	Greek	"	612	0 0 4	5 2 0	"
	Noon	"	400	0 0 4.99	4 3 6	"
	Walker	"	200	0 0 4	1 13 8	"
	Joyner	"	400	0 0 5	4 3 8	"
	Fabey	"	600	0 0 5	6 5 0	"
	Goldrich	"	400	0 0 5	4 3 8	"
	Haughton	"	910	0 0 5	9 9 14	"
	Reid	"	300	0 0 5	3 2 12	"
HARGRAVES DIVISION	Cassidy	"	700	0 0 6	8 15 0	"
	Maitland Bar	Merco	600	0 0 5	6 5 0	"
	"	"	600	0 0 5	6 5 0	"
	"	"	600	0 0 5	6 5 0	"
	M'Laughlin	Hargraves	400	0 0 5	4 3 8	"
	Bond	"	900	0 0 5	9 7 12	"
	Laidlaw	Windeyer	500	0 0 5	5 4 4	"
	Adams	Upper Merco	500	0 0 5	5 4 4	"
	Sargent	Nuggetty	500	0 0 5	5 4 4	"
	Aldis	Long Creek	500	0 0 5	5 4 4	"
	Milton	Hargraves	224	0 0 7	3 5 8	"
	West's Engine	"	1,500	0 0 18	56 5 0	"
		Totals	53,289	0 5 6.71	14,067 15 22	...

YIELD OF Gold from Wash-dirt—continued.

District and Division.	Name of Company.	Locality.	Quantity.	Average yield of Gold per ton.		Total yield of Gold.	Depth of Workings.
LACHLAN DISTRICT— Grenfell Division	Victory Lease	Main Lead.....	tons. cwt. grs.	ozs. dwts. grs.	ozs. dwts. grs.	feet.	
	" (tribute)	"	82 10 0	0 5 3'63	21 5 0	30 feet	
	"	"	45 10 0	0 6 8'96	14 10 0	"	
	Stephen & Co., and Roddy & Co.	"	59 0 0	0 10 0	29 10 0	"	
	Eager & Co., and Others	Seven-mile	1,350 0 0	0 5 22'22	400 0 0	90 "	
Cargo Division	"	Quondong	650 0 0	0 7 16'61	250 0 0	180 "	
	"	Gum Flat	2,500 0 0	0 6 19'2	850 0 0	45 "	
	"	Totals	4,687 0 0	0 6 16'29	1,565 5 0	.....

SUMMARY.

QUANTITY of Gold obtained from certain parcels of Quartz crushed during the year 1875, showing the average yield of Gold per ton.

Mining District.	Quartz Crushed.	Average yield per ton.		Total yield of Gold.	
Bathurst	tons. cwt. grs.	oz. dwts. grs.	ozs. dwts. grs.	ozs. dwts. grs.	ozs. dwts. grs.
Mudgee	828 10 0	1 0 21.64	865 16 0	677 8 18	3,206 12 0
Tambaroora and Turon	10,36 0 0	0 13 1.87	677 8 18	1,057 1 19	12 10 0
Leachlan	1,647 2 0	1 18 22.47	3,206 12 0	6,464 16 7	392 13 0
Southern	2,440 0 0	0 8 15.95	1,057 1 19	152 2 12	12,829 0 8
Tumut and Adelong	10 0 0	1 5 0	12 10 0		
Peel and Uralla	3,966 4 0	1 12 14.38	6,464 16 7		
New England and Clarence	424 0 0	0 18 12.5	392 13 0		
Totals	258 0 0	0 11 19.02	152 2 12		
Totals	10,609 16 0	1 4 4.1	12,829 0 8		

The following information has been obtained by the Wardens and Mining Registrars respecting certain parcels of Quartz crushed during the year 1876.

District and Division.	Name of Company.	Locality.	Quartz crushed.		Average yield of Gold per ton.		Total yield of Gold.		Depth at which Quartz was obtained.
BATHURST DISTRICT—	Mitchell's Creek Division	Robertson & Co.	tons.	cwt.	qrs.	ozs.	dwt.	grs.	.....
		Curnow & Co.	190	0	0	0	12	0	.....
		M'Doual & Co.	40	0	0	0	15	0	30 "
		Winters & Co.	36	0	0	1	0	0	20 feet.
	Oberon Division	Davis & Lambert.	85	10	0	3	10	4'21	10 "
		Fagan & Co.	55	0	0	0	6	0	60 "
		Luck's All.	83	0	0	0	12	6'94	60 "
		Kearns & Co.	23	0	0	0	4	0	20 "
	Trunkay Creek Division	Harper & Co.	80	0	0	1	10	0	40 "
		Arrow & Co.	47	0	0	0	1	0	45 "
MURUMBidge DISTRICT—	Gulgong Division	Hansen & Co.	8	0	0	1	0	0	20 "
		Trunkay Creek	135	0	0	0	17	0'88	3 "
		Do.	18	0	0	3	15	8	300 "
		The Star	20	0	0	1	0	0	120 "
	Mudgee Division	Totals	828	10	0	1	0	21'61	.....
		Three-mile	820	0	0	0	12	0	80 feet.
		Glazier's Paddock	150	0	0	0	9	0	120 "
		Blue Lookout	30	0	0	1	3	7	40 "
TAMBARORA AND TUBON DISTRICT—	Hill End Division	Leaving Oak Creek	6	0	0	0	10	0	surface.
		Totals	30	0	0	2	13	8	.....
		Dragon	1,036	0	0	0	13	1'87	.....
		Specimen Gully	49	0	0	1	0	0	90 feet.
	Hill End Division	Near Town	131	0	0	0	9	22'79	170 "
		Langfolds	3	0	0	17	0	0	.....
		Specimen Gully	42	0	0	0	6	7'43	.....
		Langford's	53	0	0	1	6	10'86	.....
TAMBARORA AND TUBON DISTRICT—	Hill End Division	Town & Co.	15	0	0	0	4	11'2	50 feet.
		Try Again	7	0	0	5	3	7'14	146 "
		Beard & Co.	3	0	0	1	19	16	150 "
		Hickson & Co.	48	0	0	1	17	17	125 & 190
	Hill End Division	Herman's	49	0	0	0	17	18'12	.....
		Dragon	49	0	0	1	0	0	90 feet.
		Beyers & Co.	131	0	0	0	9	22'79	170 "
		Knight & Co.	3	0	0	17	0	0	.....
TAMBARORA AND TUBON DISTRICT—	Hill End Division	Shergold & Co.	42	0	0	0	6	7'43	.....
		Dragon	53	0	0	1	6	10'86	.....
		Town & Co.	15	0	0	0	4	11'2	50 feet.
		Try Again	7	0	0	5	3	7'14	146 "
	Hill End Division	Beard & Co.	3	0	0	1	19	16	150 "
		Hickson & Co.	48	0	0	1	17	17	125 & 190
		Herman's	49	0	0	0	17	18'12	.....
		Dragon	49	0	0	1	0	0	90 feet.
TAMBARORA AND TUBON DISTRICT—	Hill End Division	Beyers & Co.	131	0	0	0	9	22'79	170 "
		Knight & Co.	3	0	0	17	0	0	.....
		Shergold & Co.	42	0	0	0	6	7'43	.....
		Dragon	53	0	0	1	6	10'86	.....
	Hill End Division	Town & Co.	15	0	0	0	4	11'2	50 feet.
		Try Again	7	0	0	5	3	7'14	146 "
		Beard & Co.	3	0	0	1	19	16	150 "
		Hickson & Co.	48	0	0	1	17	17	125 & 190
	Hill End Division	Herman's	49	0	0	0	17	18'12	.....
		Dragon	49	0	0	1	0	0	90 feet.

YIELD of Gold from Quartz—continued.

District and Division.	Name of Company.	Locality.	Quartz Crushed.	Average yield of Gold per ton.		Total yield of Gold.	Depth at which quartz was obtained.
TAMAROBORA AND TUBON DISTRICTS—continued.	Cross & Co.	Red Hill	8 tons.	10 owt.	qrs.	18 ozs.	200 feet.
	Excelsior	Specimen Gully	10 "	16 "	3 15'53	163 "	250 "
Hill End Division—continued.	Knight & Co.	Randwick	2 "	10 "	0 19'2	4 "	surface.
	Marshall & Co.	Marshall's	30 "	0 "	0 11 17'6	17 "	.....
	Amalgamated	Hawkin's Hill	38 "	0 "	3 0 0	114 "	.....
	Prideaux & Co.	Washing Gully	4 "	0 "	0 13 15	2 14 12	50 feet.
	Monte Christo	Hawkin's Hill	64 "	0 "	0 8 22'31	28 "	.....
	Cock & Co.	"	131 "	0 "	0 19 0	124 "	.....
	Johnson & Co.	Langford's	6 "	0 "	5 19 10	35 "	12 feet.
	Keeping & Co.	Johnson's Hill	69 "	0 "	1 11'82	74 "	115 "
	James & Co.	"	8 "	0 "	1 14 0	13 "	.....
	Knight & Co.	Bandwick	3 "	10 "	8 5 17'14	29 "	.....
	Star of Peace	Hawkin's Hill	53 "	0 "	1 13 7'47	88 "	433 feet.
	"	"	403 "	0 "	1 4 20	500 "	.....
	Royal Standard	"	38 "	12 "	0 5 1'24	9 "	.....
	Fischer & Co.	"	358 "	0 "	4 6 6'16	1,544 "	230 feet.
LACHLAN DISTRICT—	Totals	Totals	1,647	2	18 22'47	3,206	.....
	Bolton & Co.	Young O'Brien Reef	35	10	0 17 4'39	30	90 feet.
	Jenkins & Co.	Welcome Reef	140	0	0 6 15'25	46	220 "
	Engels & Co.	Homeward Bound Reef	431	0	0 9 17'59	209	350 "
	Ehlers & Co.	Welcome Reef	78	0	0 8 23'38	35	220 "
	Fahl	Prussian Reef	90	0	0 8 2'13	36	150 "
	Cottome & Co.	Band of Hope Reef	102	0	0 6 6'58	32	100 "
	McCowl & Co.	Lucknow Reef	200	0	0 6 14'4	66	250 "
	Hull & Co.	White Rose Reef	39	0	0 15 3'07	29	80 "
	Nelson & Co.	Brittania Reef	42	0	0 6 20'57	14	180 "
Grenfell Division	Clift and Co.	Lucknow Reef	60	0	0 4 20'	14	190 "
	Consols G.M. Co.	O'Brien's Hill	560	0	0 4 23'95	139	from surface
	Watson & Co.	Enterprise Reef, 1 mile	582	10	0 8 7'93	242	220 feet
	Homeward Bound	Cargo	80	0	2 0 0	160	.....
Cargo Division	Totals	Totals	2,440	0	8 15'95	1,057	.....
	Blatchford & Co.	Upper Araluen	10	0	1 5 0	12	40 to 60 ft.
Southern District—Araluen Division	Blatchford & Co.	Upper Araluen	10	0	1 5 0	12	40 to 60 ft.

TABLE showing the width, dip, and strike of Quartz Reefs in some of the deepest Mines in the Colony, being worked during the year 1875.

District.	Division.	Name of Company.	Name of Reef.	Width of Reef.	Dip of reef (from the horizon.)	Strike of Reef (bearing.)	Remarks.
Bathurst	Trunkey	Trunkey Creek	Eddington	ft. 9	Direction. West	N. & S.	
		"	Arthur's	1	"	"	
		Alexander	Alexander	0	"	"	
		Davis & Lambert's	Davis & Lambert's	4	"	"	
	Oberon	Fagan and Bealach	Fagan and Bealach	1	"	54 deg. W. of N.	
		Luckall	Luckall	3	"	N. & S.	
		Kearns, White, & Co.	"	0	East	"	
		Harper	"	10	West	"	
		Hassen	Five-mile Creek	3	East	"	
		Peter Arrow	Luckall	2	"	"	
Lachlan	Orange	Donowa	Breakfast Creek	6	"	"	
		Gold Point	Lucknow	3	nearly vertical	"	
		Uncle Tom	"	0	"	"	
		New Phoenix	"	1	"	E. & W.	
	Grenfell	Strickland's	Strickland's	0 to 3	East	N. & S.	
		Engels	Homeward Bound	2	"	N.E. by S.W.	
		Wharton and Co.	Enterprise	6	N.W.	"	
		Kirkpatrick & Lawless	Caledonian	4	"	E. & W.	
		Williams	Victoria	6	South	N. & S.	
		North Williams	"	16	East	"	
Tumut & Adelong.	Adelong	Great Victoria	"	1	"	"	
		Prouse & Woodward	Old Line	0 to 3	Vertical	"	
		Perseverance	Perseverance	2	West	"	
		Tributors	Peep-o-day (Ouranie)	2	"	E. & W.	
	Ten Mile Creek	No. 10	Isabella	0	West	"	
		No. 1	"	0	"	"	
		Nevada	Nevada (Paddy's River)	2	N.W.	E.N.E.	Two reefs running together.
		Pilot	Pilot (Meragle)	2	East	N. by E.	
				1			
				0			

TABLE showing the width, dip, and strike, of the Quartz Reefs, &c.—continued.

District	Division	Name of Company	Name of Reef	Width of Reef	Dip of Reef (from the horizon.)	Strike of Reef (bearing)	Remarks
Peel and Uralia	Barraba	Fletcher and Co.	Reading's ...	3	South ...	N. & S.	
		Aberdeen Tribute	Black Mountain	1	West ...	S.	
		Wheal Prosper	Foley's Folly	0 to 3	" ...	N. & S.	
	Nundle	Fuller's	Fuller's	0 to 6	Vertical	35 E. of N.	
		Reform	Garabaldi	1	South ...	N.N.E.	
	Solferino	No. 4, North	"	1	"	E. & W.	
		Lion	"	1	"	"	
		No. 1, North	Solferino	1	"	N.E.E.	
		No. 2, South	Shellmeleer	2	"	N.E.	
		No. 4, North	Solferino	1	South ...	N.E.	
		Lombardy	Band of Hope	1	"	"	
		No. 5, Shellmeleer	Shellmeleer	1	North ...	N.N.E.	
		No. 3 North Garabaldi	Garabaldi	0 to 10	South ...	N. & W.	
New England and Clarence.	Little River ...	Sedan	"	2	"	E. by W.	
		No. 8, South	Lion	1	"	"	
		No. 10 and 11, South.	"	1	North ...	"	
		Tower Hill	Perseverance	1	"	"	
	Tenterfield ...	Do.	"	1 to 7	"	"	
		Peter Guy	"	0 to 6	West ...	5° 11' N. & S.	
		Golden Crown	"	0 to 9	"	4° 49'	
		No. 1, South	"	0 to 6	"	9° 27'	
		No. 1, North	"	0 to 4	"	4° 49'	
		"	"	1	"	"	

WARDEN'S REPORTS.

BATHURST DISTRICT.

(*Mr. Warden Johnson, Bathurst.*)

THE portion of the Bathurst Mining District latterly under my immediate control merely comprised the minor workings at Oberon, Orange, Rockley, Bathurst, and Carcoar, which are principally confined to operations on a comparatively small scale upon the quartz reefs in the vicinity of the places named.

I have now no statistics in this office of the number of miners employed, but the returns from the Banks and gold buyers would seem to indicate a fair yield of gold, as far as I can judge from personal observation of the strength of the mining community in this moiety of the Bathurst Mining District. I may here point out that the returns enclosed, so far as the Banks are concerned, may be relied upon, but that, as in some instances, the gold purchased by the storekeepers has by them been passed through the Banks, their returns cannot with safety be added to the former. Quantity purchased at Bathurst, 17,149 ozs. 17 dwts. 8 grs.

3. The prospects of the copper mines, including the celebrated Cowflat mine in this neighbourhood, appear to be improving, and they are furnishing a steady supply of ore for reduction at the smelting works at Bowenfels. On the whole the mining interest has certainly not been retrograding during the past nine months, although I cannot at the same time show that there has been any sensible improvement in the production of gold as compared with the previous year, from the absence of reliable information on that point. The Gold Fields, however, upon which I have only been called upon to report, are comparatively so insignificant that it is difficult for me to found any general opinion of the future prospects of mining in the Colony from their condition.

BATHURST DISTRICT (2)—TRUNKY AND TUENA DIVISIONS.

(*Mr. Warden Smith, P.M., Trunkey.*)

THE District of Trunkey and Tuena, as far as mining is concerned, is still in a state of collapse but I have every reason to think that bottom has been touched, and '76 will see a great reaction in mining.

All the information I have been able to gather I have attached as schedules, and from which you will see there are ten quartz-mills, six being at Trunkey and four at Tuena.

The gold purchased is :—Alluvial, 1,995 oz. 18 dwts. 8 grs. ; quartz, 2,339 ozs. 17 dwts. 2 grs. ; total, 4,335 oz. 15 ozs. 10 grs., from Trunkey ; and about 1,000 ozs. from Tuena for 1875.

Copper raised in the Tuena District, at Peelwood, the return being 322 tons ore, and 32 tons 4 cwt. of pure copper—valued at £3,220.

Miners' rights and business licenses appear as 274 and 43 respectively. I have no doubt but that the number of miners' rights might have been doubled had power been given to enforce production of miners' rights by the Warden or some other person on a written authority from the Warden.

Mining is at a stand-still, there being only two leases working, viz. :—Wilson & Co. and the Sydney Company, and the schedules show the results of their operations.

Alluvial mining is poor and patchy, but nevertheless many are working and do well ; it is a poor man's diggings, but not a digging from which any fortunes have been made.

When the new Mining Bill becomes law, or the present one amended, if the clause (60) is embodied and carried out strictly, mining will again be one of our own great industries.

Filling up old shafts and making all workings secure on Gold Fields is another matter that will, I have no doubt, be considered.

BATHURST DISTRICT (3)—ORANGE DIVISION.

(Mr. Warden Lane, P.M., Orange.)

I HAVE the honor to state that very little is being done in gold mining operations in this district. There was a very rich lead struck at Ophir a short time ago, but it soon ran out, and the owners of the claim do not appear to have sufficient means to work it properly. I believe Ophir will yet prove a very rich gold field. The "forest alluvial" continues to produce about the same quantity of gold as usual. The other localities (Back Creek, Mullion, Carr's Creek, and Four-mile Creek) are almost abandoned.

I have procured from the Banks, and the only two buyers of gold I know of in Orange, the quantity of gold they have purchased and advanced upon during the past year, amounting to 7,951 ozs.

Some of this gold I believe came from Cargo and Ironbarks.

TAMBAROORA AND TURON DISTRICT.

(Mr. Warden Sharpe, Hill End.)

THE Tambaroora and Turon Mining District comprises the Turon River Gold Field, which includes Wattle Flat, Box Ridge, Quartz Ridge, and the Turon River with its numerous tributaries, down to its junction with the Macquarie River, and the Tambaroora Gold Field, which includes Chambers' Creek, part of the Macquarie River, Hill End, Tambaroora, Green Valley, Dun Dun, Bogia, Pyramul, The Crudine, and Stoney Creek.

I shall endeavour to describe each gold field in turn, and as the most convenient arrangement will take first the line of reefs which may be said to commence at Chambers' Creek, and to extend thence in this district in a northerly direction as far as Dun Dun, forming a chain of which the principal links are Chambers' Creek, the tongue of land between the Rivers Turon and Macquarie,—then Hawkins' Hill, Hill End, Tambaroora, Green Valley, and Dun Dun, this belt of auriferous country and quartz-veins is about 1 mile in width, or more correctly speaking, that width would embrace all the known gold-bearing reefs, and as the crow flies, about 24 miles in length.

Chambers' Creek.—There are two main lines of reefs, one known as Allen's Nuggety, the other as the Bourke; they are parallel and close together, the first has been prospected for a distance of about half-a-mile; the reef is well defined and is about 8 inches wide. The deepest shaft on the line is I believe, 270 feet, and gold is to be seen in the stone at that depth. This reef has produced some splendid specimens, especially in the lease known as Allen's. And on the strength of these long prices were given during the mining mania for shares in some of the leases, but the reef has never proved payable.

The lease known as Allen's is the only one now at work on this line, and it is let to a party of tributers.

The Bourke is a large well defined reef, averaging 18 inches in width. This line has been opened up about 1½ miles, and the deepest shaft on it is, I believe, the Crown Prince, which is down about 300 feet. I am informed that the stone at this depth gave over an ounce to the ton, and the reef was about 18 inches wide, the proprietors have however stopped work. The principal leases on this line are the Bismark, the Sir John Moore, the Crinoline, Welcome Home, Dolly Varden, General Grant, General Moltke, and the Crown Prince. A considerable amount of work has been done on all these, but the only ones at work now are the Bismark and the Sir John Moore, which latter is the property of an English Company, who have expended a large amount of money on the mine in the erection of one splendid battery, the purchase of another, and the construction of a wire tramway from the mine to the battery—a distance of about 1,000 feet. The greatest depth attained in this lease is 180 feet, and the Company are still carrying their shaft down with about twelve men employed. The mine however has not paid, and it is to be feared its failure has thrown a considerable damper on the investment of English capital in Australian mines. The character of the Chambers' Creek reefs, as regards gold-bearing, is what gold miners term "patchy," that is, the gold is distributed irregularly in the veins, and this quality has no doubt misled many in their estimate of the value of the reefs in this locality, and caused much disappointment. Portions of the

reefs near the surface have been very rich, but the great body of the stone is barren. The opinion, however, of miners who have worked on the Bourke and Allen's is that they have not had a fair trial. Too much money has been expended in running along the surface looking for patches, and that when greater depths are attained the gold will be more evenly diffused through the stone, and prove payable if not rich. To give an idea of the high estimate entertained of the Chambers' Creek reefs, during the mania of 1871 and 1872 upwards of eighty leases were taken up on the different lines, embracing an area of about 273 acres. Some of these leases lately cancelled have been immediately repegged and applied for—thus showing that the miners have not lost all confidence in Chambers' Creek.

Coming northwards and crossing the Macquarie we have the Welcome line. This reef was discovered by a miner named Syme, who formed a company known as "The Welcome," and they drove along the reef which was first opened in a steep ravine or gully about 100 feet altogether north and south—took out about 300 tons of stone, which was estimated to go half an ounce to the ton, but no crushing ever took place. This Company also put in a tunnel at a lower level than their drive to cut the reef, but never reached it for want of funds. The mine is now let on tribute, but I believe the tributors are waiting for machinery. The Welcome Reef averages about 18 inches in width, and extends the whole distance between the rivers; it appears to be a main reef with a bearing nearly north and south, and a dip easterly about 1 in 3.

There are a number of other leases on this line, the principal of which are the Hawkin's Hill View, Court's and Sutherland's, the Pactolus, the Cumberland, the Great Tambaroora, and the Golden Fleece. Numerous tunnels have been driven, and shafts sunk at a great expense to cut the Welcome at a depth, but, for want of funds, never reached their destination. It may be said of this line that it has never had a fair trial, as no machinery was close at hand, and the rugged nature of the country rendered the nearest machinery useless unless the stone could be conveyed to it by packing, which was too expensive. The vein was very rich indeed,—as in the case of the Randwick, which I shall mention presently. I may here remark that a fine plant has all but been completed at the Root Hog, on the Oriental lease. About £200 is all that is required to start the battery, but that sum does not seem to be forthcoming. If this plant were in working order, and crushing for the public, I believe this line would soon be in full work.

East of the Welcome several easterly underlying reefs have been prospected, of which the two best known are the Italian's and the Yankee's. The first has not been worked for some years, but it has the reputation of being payable. The last has a shaft sunk about 150 feet, and very good specimens were obtained from the vein, which is about 8 inches wide.

I now come to the Randwick reef, which is west of the Yankee's, and extends south to the Macquarie. A shaft has been sunk on this reef in the Randwick claim, as it is usually called, about 160 feet. The vein is about 4 inches wide, with a bearing nearly north and south, and dips west. Small parcels of picked stone from this—the only claim now at work between the rivers—have been brought on pack horses to Hillend, and crushed at Messrs. Pullen and Rawsthorne's battery, and given a return of as high as 20 ounces and over to the ton. A crushing a few days since gave 12 ounces to the ton. Next I may mention the Rose of Australia vein, which showed encouraging prospects, but for want of funds work was discontinued. Eastward of the Rose of Australia we have two lines of reefs, known as the Mare's Nest, on which a deal of desultory work has been done, and good shows obtained, but nothing payable. We now cross the Turon and come to the Confidence, which lease was taken up to work a large westerly underlying reef, on which a tunnel was driven some distance, and at a depth of about 200 feet vertical a considerable amount of stone was taken out showing gold, but the results of the crushing are involved in obscurity.

East of the Confidence, and at the back of Bragg's Inn, are a series of reefs or veins, known as the Queen of the Ranges line. Here the country has been greatly disturbed and tossed about, as these reefs, though probably belonging to the Hawkin's Hill line, cannot be traced to a connection with them. The Queen of the Ranges' vein gave some very good surface stone where the reef ran flat, but as soon as it turned the gold disappeared.

From this northward to the Saw-pit Gully most of the work has been confined to the western side of Oakey Creek, for although the main line of the Hawkins' Hill veins is supposed

to run on the eastern no prospects worth speaking of have been obtained on that side. In this locality the reefs worked are first a supposed continuation of Brand and Fletcher's line. In the lease known as the Colleen Bawn, and in the two adjoining leases, a good show was obtained in a winze sunk from a tunnel driven from the creek at a depth of about 80 feet. The vein was about 6 inches wide, bearing north and south, and dipping easterly. West of Brand's vein we have a line of leases on what was supposed to be Eisenstadter's vein. They were called the Great Britain, West Hawkins' Hill, and Magellan Cloud. Shafts were sunk on all these mines, but without reaching the vein sought for. West of Eisenstadter's is a vein known as the Star of Hope, from which excellent prospects have been obtained. This reef has been worked in the Old England mine, the Star of Hope, and two others. Underlay shafts have been sunk in all these from 150 to 250 feet, and handsome specimens obtained. The width of it varies from 2 inches to 10 inches. The bearing is north and south, and the dip easterly. The Star of Hope and Old England are now worked by a Co-operative Company, who are driving at the 175 feet level east to intersect veins cut in the shaft which is over 200 feet in depth. I believe a crushing of a few tons at that depth gave 15 dwts. to the ton. West of the Star of Hope is a very large reef, known as the Queen Bee. The width is about 4 feet, and there is a fair show of gold, but little work has been done on it as yet. This completes the easterly veins which have been discovered.

The westerly veins underlying to the west are first the South Star line. The leases worked in this are the South Star, the Clan Campbell, and several block claims, and then the Lord Ashley. Shafts were sunk to a depth of 250 feet in the South Star lease, but with doubtfully payable results. The reef is about 4 inches thick and has been traced about a mile and worked at intervals; this vein, I am informed, gave rich returns from surface crushings some years back. West of the South Star line several reefs have been worked, but not sufficiently to prove whether they are payable or not.

We now come to the famous Hawkins' Hill veins. They may be divided into three systems,—Centrally a main line, and on either side an outside one. The main line consists of—

1. Holman's veins—two in number and 6 feet apart. These have been wrought from the Monte Christo Mine to Paxton's, a distance of about 346 feet. The mines now at work on them are Rawsthorne's, Cock & Attwood's, Hickson, Crighton & Beard's, and Paxton's. The average width of these veins is from 6 to 8 inches, and they have been generally payable.

2. Paxton's veins are about 6 feet west of Holman's and three in number. One of these, the hanging wall vein, is known also as Krohmann's big vein; and Rawsthorne's—these vary in width from 1 inch to 3 feet; the bearing of all the veins on the Hill worked is from 5° to 12° east of north.

3. Brown's veins are a mass of leaders in the horse between Paxton's and the Star of Peace, and have supplied a large proportion of the gold which has made Hawkins' Hill so celebrated. This system of veins does not extend further north than Paxton's north shaft, there being none of them in the horse in the Star of Peace vein.

4. Thirty feet west of Paxton's vein we have that known as the Star of Peace, and which is probably identical with Holtermann's veins; this appears to be the main vein of the Hill and has been traced from Carroll & Beard's on the south to Mathewson's on the north, a distance of about 760 feet; the average size of this vein is about 8 inches, and the yield 3 ozs. to the ton. In the Star of Peace Mine it has been proved payable to a depth of nearly 500 feet. In Fisher & Beard's it is 3 feet thick in places, and has yielded as high as 7 ozs. to the ton. The last large crushing from this vein, at the 480 feet level, gave about 40 ounces to the ton. West of this we have—

5. The series of veins which gave the rich crushings known as Holtermann's, Krohmann's, and Carroll & Beard's—the width of these veins varies from 2 to 4 inches, and the vein stone is enclosed in soft black slate; they appear to be represented in claims north of the Rampant Lion by a vein known as the west vein, which has been very rich in Paxton's mine.

East of the main line and separated from it by a dyke of trachyte are the veins known as "Stephens', the Frenchman's, and Rowley's." The first of these has been worked to a depth of over 300 feet, and the gold appears to go down in narrow perpendicular shoots, but not sufficiently diffused to make the vein a payable one. It is probably identical with the

Rose of England vein, and if so has been worked from Tallentire and Beard's as far north as the Trust and Try. The Frenchman's vein has been worked to a depth of 240 feet, and shafts sunk to a depth of 260 feet. The mines in which this vein has been worked most are the Cornish, the Frenchman's, the Amalgamated, and the Cornelian; it is generally supposed to be the same vein as the Scandinavian, and if so, has yielded payable gold in the Scandinavian lease. The average width is about 6 inches, and varies from 1 inch to 2 feet; the dip is east, 1 in 4, and the bearing 7 degrees west of north. Rowley's vein was worked some years back, and appears rather as a lode enclosed in sandstone than a quartz reef. The gold was all extracted from the matrix by washing without the aid of machinery. The bearing and dip are the same as the last. The leases known as the Crown Prince and Londonderry have sunk shafts to catch this vein, but without success, finding only a narrow leader at 120 feet. The only mine working on this line is a 4-acre lease, known as the Rose of Australia or Goodwin's Venture, and they have a shaft down 60 feet, driving for a vein to the west, between Rowley's and Stevens'. This completes the easterly system.

The westerly system is separated from the main line by a broad belt of trachyte, and comprises Brand's veins, about a dozen in number, worked mainly in Brand and Fletcher's claim and Eisenstadter's vein, worked in the Royal Standard (better known as Eisenstadter's), the Lady Belmore, and others; this reef is from 4 to 5 inches thick, and the deepest working on it is in Eisenstadter's lease, 250 feet; it has been worked at intervals for about 1 mile; the stone has gone as high as 7 ozs. in the Lady Belmore lease. The Royal Standard is the only claim at present at work on this line; this completes the veins known as the Hawkins' Hill veins proper. I may here remark that at the present time the only mines on Hawkins' which appear to be paying anything more than working expenses are Paxton's, the Star of Peace, and Fischer and Beard's.

With regard to Hawkins' Hill, some of the leases have stopped working altogether; others are being worked on a more economical system than heretofore. The gold mine known as Carroll and Beard's is associated with those known as Krohmann's and Beyers' and Holtermann's. The main shaft in the first-mentioned Company's ground is being sunk to a greater depth than that yet attained, viz., 530 feet, with a view of thoroughly proving the three mines. For a similar reason the Star of Peace Company include in their working the mines known as Mathewson's, Oxon's, and Myers and Stevens's. The Patriarch, a well-known lease on Hawkins' Hill, in the hands of a few enterprising and wealthy men—is being thoroughly prospected.

At the back of the township a considerable amount of surface work has been done on veins which are supposed to be a continuance of the Hawkins' Hill line, but in this locality they are distinguished by different names from those by which they are known on Hawkins' Hill; for instance, the Scandinavian is supposed to be the same as the Frenchman's—the Blocker's vein, from which a considerable amount of gold was taken in days gone-by as Stevens's—and the Excelsior, which I shall mention hereafter as Sergeant's. I may remark here that two mines, the Boston and Eureka, have done a considerable amount of work on a belt of veins between the Blockers and the Excelsior, and in the last mentioned, the Eureka, a shaft 280 feet deep has been sunk, and a reef discovered carrying gold, but not in payable quantities. A considerable amount of work has been done on the Scandinavian reef, which has afforded in years past payable stone; it has been worked in the Scandinavian lease—the Royal Alfred, the Just-in-Time, and a number of block claims. It is to be regretted that this line is now idle.

The Excelsior, on Sergeant's reef, is a cheering exception to the general unsatisfactory state of the mines in this division. I am informed that the reef was cut at a depth of 207 feet and proved very rich though small, varying from 1 to 2 inches in width. The average yield per ton for 12 months has been about $27\frac{1}{2}$ ozs. The area leased by the Company, and which is a private one, is 4 acres, and this mine has been in full work, I believe, since May, 1874. It is to be hoped that this vein may be discovered in the adjoining leases and afford the same returns as in the Excelsior.

Eastward of the Excelsior we have another reef, known as the Dragon, and this too is yielding satisfactory returns to the shareholders. The reef is peculiar in appearance, being stained with iron; it is about 6 to 8 inches wide, in soft country, and has given from 1 to 2 ounces to the ton. The gold is not often visible in the stone, and specimens are uncommon.

The depth attained is 152 feet. This reef has been cut in the Venus and Prince of Wales leases adjoining the Dragon; in the former the prospects are good; in the latter, work is discontinued. I would remark here that this portion of the gold field seems to be covered with about 200 feet in depth of made ground, in which the veins take such erratic courses as to render the following of them exceedingly difficult; nothing payable has been obtained within the last five years between the last-mentioned lease and Tambaroora, excepting on Langford's line, from which a few payable crushings have been taken. Prior to that several rich deposits were found on what is known as the Red Hill and Golden Gully line, but nothing permanent. These reefs are deeply stained with iron, and appear to have been subjected to intense heat. Many of them contain hollows filled with a soft black powder, and the gold is found adhering to the sides of these cavities. Here I may remark that the whole of the Red Hill and Golden Gully would pay handsomely for sluicing if water could be got to bear on it, which is a difficulty not easily surmounted. After every thunder shower, fossickers may be seen scraping out all the little gutters, and sometimes are rewarded for their trouble by finding very coarse gold. I now pass on to Tambaroora. This has been one of the richest alluvial gold fields in the colony, but has been worked out, one may say, for years.

The reefs worked in this neighbourhood are the Canton Reef, by Chinamen principally, and supposed to be payable to the water-level—about 90 feet; after that the expenses become too heavy for the yield. I may mention here the Britannia and Independent Reefs, which are south and west of the township of Tambaroora; north are the various reefs on the Red Hill, worked in the Red Hill Company lease; the Gigantic Struggle, the Perseverance, the Marshall M'Mahon, and other leases, and proved payable in them all to a depth of 200 feet, when water was struck and rendered the employment of machinery necessary. This has caused a cessation of work in all these claims or leases, excepting the Red Hill Company, where they are taking the surface quartz out. It is probable this Company will prove the Red Hill line, as they have a fine battery, machinery necessary for getting rid of the water, and a confidence in the value of their mine, which probably will be rewarded if indications are of any value. This Red Hill line may be termed the favourite reef of the district.

Another line running south-west from the crown of the Red Hill is White's Reef, which has been worked with payable results to a depth of about 70 feet, when water put a stop to the workings. There is, I believe, nothing doing on this reef at the present time. About a mile and half from Tambaroora north is an abandoned alluvial diggings, known as the Dirt Holes. Various reefs in this neighbourhood have been worked, and most of them with payable results, but they are now lying idle. At the Green Valley the same state of things exists, great results were expected from the reefs in the locality, and large sums of money expended in what may be called surface workings, but without any satisfactory result. Still advancing northward we come to the Dun Dun.

The reefs in this part of the district labour under the disadvantage common to most others. They have never had a fair trial. The principal line is known as the Craigend, and has been prospected for a distance of about 2 miles; and numerous shafts sunk varying in depth from 20 to 215 feet. On the Craigend lease a fair return was got from what little stone has been crushed, being 2 ozs. 5 dwts. to the ton. The reef averages 15 inches in width. The character of the stone is seamy and contains a quantity of pyrites; the country is soft, and the working not expensive, costing for sinking about 20s. per foot. The place is deserted as far as the reefs are concerned, not a single lease or claim being at work, but there is some chance of work being renewed in the Craigend Mine before long.

The Pyramul, which is situated about 20 miles in a north-westerly direction from Hill-end, has been a rich alluvial diggings. The only reef at work in this neighbourhood is that known as Beyers and Weir's. These gentlemen have erected a fine plant, and I believe are at the present time engaged in sinking on the reef, which is a large one. It is to be hoped they will be rewarded for their enterprise and meet a suitable return for the expense incurred.

The next line of reef I shall mention is that lately opened on the Crudine Creek. About five leases, containing an area of some 32 acres, have been taken up on the Homeward Bound, for so this line of reef has been christened.

Four of these leases are I believe in the hands of a private company, who are erecting a battery and sinking on the reef; so far the stone has been rich; 5½ tons crushed at Hillend

gave the handsome return of 36 ounces. I am informed that there are at the present time about 25 tons at grass, and it is expected the yield from this will not fall short of that obtained from the trial crushing. It is to be hoped that the reef will be thoroughly proved and not thrown up as in most cases directly a crushing does not prove payable. I may add that the reef is from 6 to 12 inches in thickness and well defined.

About due west from Hillend and distant 12 miles is a basaltic hill, known as Pulley's; it is part of a range extending for about 30 miles on either side of the Macquarie. The hill referred to is about 700 feet above the river, which it almost overhangs; is about one mile and three quarters in length, and from 100 to 500 yards in width, and the top of the hill has the appearance of having been levelled. The basalt appears to be about 100 feet thick, viewing it from the side of the hill; beneath the basalt is found cemented drift from 1 to 12 feet in thickness, overlaying a bed of soft pipeclay or decomposed slate. The wash-dirt over the pipeclay varies from a foot to eighteen inches in thickness, and has been proved payable in certain places, even with very rough appliances. Tunnels are being driven into this hill at various levels, and with proper machinery, skilled labour, and economical management, Pulley's Hill, and probably the adjoining hills, may prove as valuable as similar formations in the sister Colony. This hill is leased chiefly in large blocks. At the present time only about ten men are employed on it; but two large batteries and the necessary appliances are being erected on the ground, and should the cement underlying the basalt prove payable, and there is little doubt of it, this and the adjoining hills will probably afford employment for many years to a large digging population. Lower down the river, and on the opposite side are similar hills; two of them known as Finch's and the Horse Bald Hill. About thirty men are working at Finch's; one tunnel is in 300 feet, and I am informed the owners have obtained as much as 4 dwts. to the load.

I now come to the Turon River Gold Field which, as I have stated at the beginning of my report, comprises the river Turon and numerous tributaries, from Sofala upwards to Jew's Creek, and downwards to its junction with the Macquarie. The river bed and alluvial workings may be said to be exhausted, although there are still scattered along the river and up the various tributaries parties of Chinese and a few Europeans at work. The reefs at Nuggety and Spring Creek, near Sofala, during the mining mania, excited a good deal of attention, and deservedly so as far as is known of their character. Large areas were leased, and larger sums of money expended, though not on the reefs; one by one the mines have ceased working, and at the present time reefing may be said to be dead in this portion of the Tambaroora and Turon mining district, the only mine at present working being that known as Moyle's Surface Hill. This mine is situated at Wattle Flat, and has for many years borne a very high character for the richness of its auriferous deposits. It was worked for a considerable period by a co-operative company, who took a large amount of gold from it by mere surface working; then it fell into the hands of the present company who seem well satisfied with their purchase.

The veins are numerous, payable, in some instances rich, and close together, and the company have a small but excellent plant in close proximity to the mine. This lease has been at work constantly in the hands of the present company for about three years, and the capital has been expended in opening up the mine.

At Boiga I am informed the reefs were very promising as far as the prospecting of them went; a large area of ground was leased, but little work done, and now the place is abandoned.

At Box Ridge a few claims are at work, and, I believe, with good prospects. This place and the Quartz Ridge have been the cause of much excitement on account of some very rich finds of surface quartz. The last-mentioned place is now idle as far as reefing is concerned, but I believe work will be resumed shortly,—the line of reef tried being regarded as likely to prove valuable.

I shall now make a few remarks as to the alluvial mining in this district, and these will apply to the whole of it, except Pulley's Hill, and similar formations. The alluvial in the neighbourhood of Tambaroora has been very rich in places; every creek and gully (and they are numerous) has been, more or less, auriferous, and at one time supported a very large population, but may now be said to be exhausted.

The alluvial miners in this district are chiefly Chinamen and fossickers. Very few Chinamen, it will be observed, do anything in quartz-mining; their labours are confined to shallow alluvial and river workings, for which they display a remarkable aptitude, appearing to be indifferent to wet and exposure, working in large bodies, and being satisfied with moderate returns. The Turon and Macquarie, and many other places for many miles, have been worked over and over again by co-operative bands of Chinamen.

In conclusion, I regret to have to report that the mining in this district is not in a flourishing state; the effects of what has been aptly styled "the mining mania" are still only too apparent, but I think we have passed the worst stage of depression.

Hawkins' Hill—to which the mining world seem to look as the beacon which must be lighted up before we can have brighter days—does not appear to be in a prosperous condition. Very few of these mines are paying more than working expenses at the present time, and what is wanted, in the opinion of practical miners, is "amalgamation," in order that this hill, from which such marvellous quantities of gold have been won, may be thoroughly proved. The areas of most of the leases, which have been very productive, are small, and have been worked, comparatively speaking, to very shallow depths, but to such depths the mines appear to be exhausted, and as each company's parcel of land is so small it is not worth while, on account of expense (sinking, it must be remembered, in this locality, costs about £10 a foot), to follow the veins down to a great depth, where possibly a second run of gold would be discovered.

Until amalgamation is an accomplished fact, the vast army of managers, legal and mining, directors, and all the paraphernalia which go to swell the expenses of these mines, will most effectually prevent the thorough exploration and proving of Hawkins' Hill; whereas, under a proper system, much of this expense would be saved. Another great drawback to the progress of mining in this and other places is the want of local directors. Under ordinary circumstances the whole direction of the mine is in the hands of men who reside at great distances, in some instances hundreds of miles, from the scene of action, and who, even supposing they possess the necessary mining knowledge, require, in order that their duties may be properly fulfilled, and, with the least possible expense and delay, to reside at or near the mine over which, by virtue of their office, they exercise so powerful an influence for good or evil.

Another evil most detrimental to the progress of mining, arises from the fact that it has been undertaken, in many instances, simply as a stock-jobbing speculation, and with a view of making money out of shares, and not as a well considered plan for the development of the mineral resources of the Colony. I do not attribute the depression in mining to defects in the mining laws and regulations, though possibly they may have had some effect, but rather to ill-considered attempts at mining. People of all classes rushed into the pursuit as if they had merely to sink a shaft anywhere a few feet, and would find gold in the bottom, instead of giving this most hazardous of all industries their most careful consideration, and taking proper precautions to ensure success. There are only too many shafts sunk and tunnels driven in this district which could be appropriately termed "So and So's Folly."

There is a vast field in this district alone for quartz mining, and, as yet, except in a very few cases, nothing has been done except prospecting, and that in a very desultory way. The deepest shaft in the district is only a few feet over 500, and the great majority do not reach 200 feet.

I do not expect that the enormous yields taken from Hawkins' Hill will be repeated, but still it is very improbable that all the wealth of those veins has been exhausted. And there are beyond all doubt many reefs here and in other parts of the Turon and Tambaroora districts which will amply repay investors if properly worked.

As a symptom that mining is not dead amongst us, and all faith is not lost in the district, I note that as soon as a lease is cancelled which is known to contain a reef from which good stone has been taken in times past, or which affords fair prospects of success, the land is immediately applied for again and labour is at once put on, or arrangements made for working it as soon as the lease is issued. In some instances that I am aware of this enterprise has been rewarded, and very payable stone obtained.

I may also mention that a fair amount of prospecting is being carried on in this district by the miners at this time, either on their own account, backed by their mates who are

working in the various mines, or assisted by local capital, and, to the credit of the district, be it said, this assistance is nearly always forthcoming.

Should these attempts at development prove successful it is more than probable that money will be easily procurable from other sources to carry on the war.

From these signs we may gather that the miners are fully alive to the fact that it lies with themselves to give mining its proper position among the other industries of the Colony.

I may mention, however, that there have been one or two small alluvial rushes reported during this last quarter. The most important occurred at Back Creek, between Sofala and the Mudgee Road. I am informed that some coarse gold was obtained, but that the place is now almost abandoned. Some prospecting is being carried on on the reefs in the vicinity of Hillend, and in one or two instances the prospects are good.

I am informed that many of the miners who left this district, allured by the glowing reports from other gold fields, have returned, convinced by personal observation that the prospects are better here.

I annex a schedule showing the amount of gold sent by escort from this district during nine months of the present year, and that amount, I believe, represents very fairly the quantity of gold won during that period from these gold fields.

RETURN showing the yield of Gold in the Tambaroora and Turon Mining District, for the year ending 31st December, 1875.

Division.	For the Quarter ending			For the Quarter ending		
			ozs. dwts. gra.			ozs. dwts. gra.
Hill End.....	31 Mar., 1875.....	Alluvial ...	908 13 13	31 Mar., 1875.....	Quartz ...	5,113 10 17
	30 June, 1875.....	" ...	682 6 12	30 June, 1875.....	" ...	4,198 6 23
	30 Sept., 1875.....	" ...	941 2 18	30 Sept., 1875.....	" ...	3,238 2 21
	31 Dec., 1875.....	" ...	661 3 15	31 Dec., 1875.....	" ...	3,491 11 17
			3,193 6 10			16,036 12 6
*Sofala	31 Mar., 1875.....	.....	.....	.....	.....	2,022 4 3
	30 June, 1875.....	.....	.....	.....	.....	1,843 3 10
	30 Sept., 1875.....	.....	.....	.....	.....	1,979 2 2
	31 Dec., 1875.....	.....	.....	.....	.....	2,166 0 13
						8,010 10 4
*Ironbarks ...	31 Mar., 1875.....	.....	.....	.....	.....	734 13 15
	30 June, 1875.....	.....	.....	.....	.....	597 14 23
	30 Sept., 1875.....	.....	.....	.....	.....	1,053 5 15
	31 Dec., 1875.....	Alluvial ...	617 3 0	.....	.....	527 4 4
			3,810 9 10			2,912 18 9

* Cannot ascertain the portion of alluvial gold.

SUMMARY.

		ozs. dwts. gra.	ozs. dwts. gra.
Hillend—	Alluvial	3,193 6 10	
	Quartz	16,036 12 6	
			19,229 8 16
Sofala—	Quartz and Alluvial ...	.....	8,010 10 4
Ironbarks—	Alluvial	617 3 0	
	Quartz	2,912 18 9	
			3,530 1 9
			30,770 0 5 at £3 17s. 6d. per oz., £119,233 15s. 9d.

MUDGEES DISTRICT.

(Mr. Warden Browne, P.M., Gulgong.)

It will be apparent from the statistics furnished by the Mining Registrar for the Mudgee District, that its highest point of productiveness was reached in the year 1872, when from the alluvial fields of Gulgong and its vicinity not less than 134,455 ozs. were dispatched by escort. From the 10th May, 1871, to 30th September, 1875, nearly 16 tons of gold were sent to Sydney from these gold fields, the exact number of ounces being 424,477 ozs. 12 dwts. 14 grs.; value, at £3 15s. 6d.; average price at the Bank,—£1,602,403 0s. 7d.

Such has been the enormous yield in little more than four years of the alluvial drift lying for the most part beneath a stratum of basalt in this immediate neighbourhood. But it will be observed that the yield fell, during the last year to 68,354 ozs. 19 dwts. 15 grs., while during the first nine months of the present year the amount sent from Gulgong and Home Rule, still the most important gold fields in the Mudgee Mining District, has only reached the total of 24,799 ozs. 4 dwts. 18 grs.

While such a conspicuous reduction proves the partial working out of the more prominent alluvial deposits, and a corresponding exodus of miners, it is still believed that the extensive area within which deposits of such exceptional richness have been found has not been so completely exhausted but that important discoveries may still be made. The once celebrated leads, the Happy Valley, the Star, and the Black Lead, show a tendency, in the judgment of experienced miners, to converge at a point near the lower end of the Black Lead in deeper ground than has yet been worked. If a main gutter be discovered under such conditions a revival, even an eclipse of the former prosperity of Gulgong, may be predicted.

The reefs in the Mudgee District can hardly be said to have been thoroughly explored, or worked at such depth as to warrant a decided opinion upon their ultimate value. At present the Welcome, the Morning Star, and the British Lion are payable, and among the most encouraging investments. In the vicinity of Hargraves, and at Windeyer and Mitchell's Creek, as also in other localities within the district, well defined reefs exist, which the shareholders confidently expect to be eventually profitable.

On the river Cudgegong the sluicing of large areas is being carried on at considerable outlay. Expensive dams and miles of water races have been constructed for the purpose of testing the river bank and the abandoned shallow workings.

Copper as yet is the only metal, other than gold, with one exception, that has been discovered within the district. At Mitchell's Creek, near Wellington, two highly encouraging lodes have been partially worked. To one of these, known as "Fidler's Mine," machinery to the value of £2,000 is being conveyed at the present time. A cinnabar mine, in the vicinity of the Cudgegong, within 25 miles of Mudgee, has lately recommenced work.

With respect to the mining prospects of the Mudgee District I may state my conviction from past experience that fresh discoveries in the alluvial will from time to time occur. From the reefs, when worked at deeper levels, a large and steady yield may be looked for,—the true and permanent mainstay of a mining community. And, from the general superiority of the soil, and the temperate nature of the climate, I anticipate a continuous settlement of the miners upon the land, constituting a population thus enabled to combine the advantageous pursuit of agriculture with the occasional enterprise and tempting rewards of gold mining.

The almost unprecedented absence of rain, combined with the temporary absence of a large number of the settled mining population of Gulgong at the Mandurama rush, near Carcoar, has seriously affected the yield of gold for the last quarter of the past year; but with the ordinary autumn rainfall a considerable addition to the escorts may be looked for. Large quantities of wash-dirt are now, in many instances, lying stacked and ready for puddling. The work at the Welcome Reef, at Three-mile, has been much retarded by the exceptionally dry nature of the season on the Canadian, which has always been a steadily remunerative locality. A new run of gold has been traced near the Nil Desperandum, and the character of the locality for great depth rather than richness of wash-dirt sustained. In the Parramatta Reef, near the head of the Black Lead, the last crushing yielded a fair and encouraging average.

It will be granted by those acquainted with the Mudgee Mining District that a combination of causes has led to the exceptionally low yield of gold, and a comparative stagnation in mining operations now apparent; but the possibility of other rich discoveries in a district of generally auriferous formation, unaccompanied by surface indications, cannot be denied, while the large area of partially exhausted alluvial may yet be advantageously worked by companies with the aid of efficient and modern machinery. The neighbourhood of Gulgong in particular will, in my opinion, supply a field for such enterprise for many years to come.

LACHLAN DISTRICT—NORTHERN DIVISION.

(*Mr. Warden Dalton, P.M., for the Lachlan*)

I HAVE now the honor to report upon the present state of the mining district under my charge, and regret that I have been unable to do so at an earlier period. On referring to my Report for the year 1874 you will observe that at the close of that year the mining population were located to the southward of the Billabong or Goobang Creek within the extension of the Billabong Gold Field, and in the vicinity of five leads that had then been recently discovered in the alluvial plains that stretch towards the Lachlan River. From January last these leads have been worked with unremitting energy, three with much success, the greater portion of the gold transmitted from this district to Sydney by escort during the current year having been obtained from this portion of the gold field. So important were these leads considered in July last that the Australian Joint Stock Bank, the Commercial Bank, and the Bank of New South Wales each opened branch establishments at Tichborne exclusively for the purchase of gold.

Of these leads the most productive has been the Wapping Butcher, situated on the northern side of Tom's Knoll; it is a continuation of the Fairy Lead, both following the summit of a ridge of palaeozoic rocks, that at a depth below the surface, varying from 45 to 72 feet, extend to the northward.

This ridge is intersected by an igneous dyke carrying quartz reefs upon its flanks. The centre appears to have been cut through from east to west near the ancient base of the knoll. It is here that the ground is 72 feet deep, that to the north and south becoming gradually more shallow until it reaches 54 feet in depth on one side and 45 feet on the other, the shallow claims to the northward, proving to be the most productive.

Some of the hard transmuted strata upon which the wash rests are interpolated by soft decomposed formations.

Mingled with this wash are quartz boulders, many of these are so large as to be immovable by any force the miners can apply except gunpowder; all are more or less water worn and rolled. With these are associated pebbles, clays (red, brown, and white), fragments and blocks of conglomerate. These fragments are locally known as clinkers, and with the exception of the cement are similar to the loose wash; solid nuggets of water-worn gold have been frequently obtained from them.

A few yards to the south-east of the channel cut through the lower palaeozoic rocks two shafts at a depth of 30 feet below the grass struck a red quick-sand; this extended 25 feet deeper, when a little gold was obtained off the bottom. The stream of sand about 30 feet wide appeared to flow to the south-west round the base of Tom's Knoll, and above it there were no claims of value. A similar sand was found in a shaft three-quarters of a mile distant in the same direction.

One hundred yards to the east of the Wapping Butcher the alluvium of the plain becomes deep, and consists of clays and gravel. About 6 miles further to the east is a conglomerated drift 300 yards wide, apparently of the pleistocene period; it is several miles in length, and extends to the eastern ranges that flank the granite formations; it is probably the bed of an ancient river, once rapid, shallow, and turbulent in its course. The alluvial plain separates this drift from that round Tom's Knoll. Three or four holes have been rooted in the margin of this conglomerated drift, and a little gold obtained therefrom, but nothing payable.

Neither the beginning nor the end of the Wapping Butcher Lead has been clearly ascertained; it appears at present to have been cut off at its southern extremity by the quick-sand; and may be found to commence and end with the conglomerated drift.

The fragments of light blue hardened slate found entangled in the conglomerate are the same in all respects as some strata *in situ* forming portions of the bed rock, but the quartz boulders differ from the stone in the reefs in the vicinity. They may however have been derived from a higher portion of the same reefs, now broken into fragments and destroyed by denudation. I cannot ascertain that any person has actually obtained gold from these reefs although there is undoubted evidence of fragments of quartz, richly impregnated with gold, having been found in the wash; these may have been derived from the drifts, but in opposition to the idea of these fragments having been transported from any considerable distance is a statement made by the local gold buyers, "that the gold from each lead differs in quality and value." If such be the case the conglomerate must be derived from the rocks *in situ*, the debris having been removed but a very short distance and in one direction, by fluvial action.

The quartz boulders have the peculiar rusty colour so frequently to be observed in fragments of a similar veinstone forming the base of the older conglomerates; all are more or less rounded and water worn; and appear to be the base of a pleistocene drift, the wreck of which now reposes upon the palaeozoic rocks of the district. The vein stones in these latter although auriferous contain much less gold and in smaller masses than that derived from the disintegration and redistribution of the base of the ancient drifts. I now feel assured that all the exceedingly rich specimens of gold bearing quartz and nuggets of gold found upon this field are derived from the base of the conglomerated drift under consideration, and that where leads have been discovered this drift is also present in some form.

The Wapping Butcher Lead is in some places two claims wide, and for about 1 mile in length has yielded a large quantity of gold. Since January last Carroll and three others from a claim of 220 feet by 220 feet obtained 1,050 ounces. D. Bowes and three others from a similar area obtained gold to the value of £4,000. Amongst others my attention has been drawn to a claim of 220 feet by 220 feet held by William Jones and three others. This claim, situated on a dead level in the midst of a thick pine scrub, presents no surface indication of any description beyond a rich chocolate soil to attract the miner; it was first occupied in January last. The sinking was through

Chocolate soil	...	...	...	...	...	4 feet
Yellow striated clay, mixed with quartz gravel	...	...	...	...	...	10 "
Quartz gravel	...	...	...	...	...	4 "
Partially decomposed conglomerate of quartz gravel, pebbles, and boulders, mixed with fragments of ironstone, igneous and and transmuted rock, and various slates and shales	...	...	...	...	...	20 "
Coarse red and brown sand, and drift	...	...	...	...	...	12 "
Auriferous drift apparently derived from the base of the conglomerate	...	...	...	...	...	4 "
Making a total depth of						54

With respect to the conglomerate the greater part was disintegrated, and nearly all the pebble except those of quartz and some highly silicified fragments of schist, were decomposed and reduced to clays of various colours still retaining their original form, some portions of these being reconsolidated by an infiltration of lime and iron. Where this lime and iron have not been removed large blocks and fragments of the conglomerate remain in their original state; these are locally called clinkers, but where they have been removed the base of this conglomerated drift forms the auriferous wash of this part of the gold field, and it appears probable that it is from this source and not from the quartz reefs *in situ* that the richest leads have been supplied.

The yield of gold from the small claim referred to has been as follows:—

						oss. dwts. gra
1st washing	23rd March, 83	loads...	...	...	...	54 11 0
2nd "	21st April, 84	" ...	...	...	...	24 18 2
3rd "	25th May, 89	" ...	...	...	...	25 3 12
4th "	13th July, 229	" ...	...	...	...	511 10 0
5th "	11th Sept., 180	" ...	...	...	...	710 9 12
6th "	Decr., 340	" ...	...	...	...	1,380 0 0
giving a total of						2,706 12 2

as the proceeds of the labour of four men for twelve months. Nearly one-third of the claim is still unworked. From an adjoining claim a nugget weighing 26 ozs. has been obtained. In the same vicinity Kenna and party obtained 1 oz. 10 dwts. per load, Francis and party 1 oz. per load, Murphy and party 3 ozs. per load, M'Fadden and party 2 ozs. per load, and Williams and party 3 ozs. per load. The claims of Madden and party, Buckley and party, and Barlow and party were also highly satisfactory.

The thickness of the wash is from 2 to 5 feet; lower down the course of the lead has not been clearly defined; a few claims in that direction struck small patches of payable gold.

At the head of the Wapping Butcher Lead there is a network of claims, all of which although outside blocks either have been within the year or are now producing payable gold.

The Tichborne Lead, a westerly branch cutting as previously described through the Wapping Butcher, is somewhat deeper than that lead, but of the same character, the auriferous deposits being derived from the same source; the wash is finer and contains more clay and sand and a smaller number of boulders; the thickness of wash dirt ranges from 2 to 12 feet at the upper end; here also fragments of conglomerate are interspersed through the wash. The lead is tortuous and varies in width; the depth is 72 feet at the head, deepening in its onward progress to 130 feet at its western extremity; for the first half mile of its course the claims were all rich, each producing large quantities of gold; in some instances the depth and width of the wash compensating for the poverty of the yield per load. No. 6 gave McCann and party within the year 1,700 ounces of gold. About twenty-five claims situated within an equilateral triangle, not exceeding half a mile in length, have supplied 7-10ths of the gold forwarded by escort from this gold field during the year 1875. The original prospectors shared the fate common to pioneers; they obtained their prospect of 2 dwts. and no more; sank and drove 1,200 feet, and after eight months' labour, and having defended two actions initiated by jumpers, abandoned the ground. Below the Prospectors down to No. 9 frontage, the claims yielded little more than wages. No. 10, at a depth of 130 feet, with 2 feet wash, produced 1,000 loads that yielded 15 dwts. per load; below this the lead cannot be traced although it has been perseveringly sought for. With the exception of a few claims at the head the Tichborne lead has been exhausted.

The Fairy lead was also a success, of the same character as the Wapping Butcher, situated upon the same line of palæozoic rocks the yield from the several claims was not much inferior. One claim produced £2,000 worth of gold, and three other parties have each obtained gold to the value of from £1,200 to £1,800. These claims are still worked.

The Fulton lead did not prove payable, although it produced some heavy nuggets of water-worn gold, and after having been worked for six months it was abandoned. It appears to be the termination of one of the leads on the north bank of the Goobang Creek.

M'Guiggan's South: But little progress has been made towards the development of this lead during the past year. The claim of Barnett and party near the creek has been worked continuously; the yield is 10 dwts. per load, and the wash abundant; the last washing of 140 loads produced 70 ounces of gold. Nos. 6, 7, and 8 are also energetically worked; produce 8 dwts. per load. No. 9 yields small wages. All the remaining claims are for the present abandoned as unprofitable. The deep claim (167 feet) has also been worked out, and the gold has not been traced outside its boundaries.

There was a lead reported by a party of experienced prospectors 9 miles from Forbes about April last; the prospects obtained were about 1 dwt. to the dish; nevertheless it proved a failure.

In this district, where coarse gold is the rule, prospecting by dish is very unreliable; nothing less than the puddling-machine will prove the value of the ground.

There have been no discoveries within this portion of the district during the year; two prospecting shafts have been sunk upon the plains in the deep ground; gold was procured from the bottom of each, but not in payable quantities, whereupon they were abandoned. Prospecting has not been followed up with the same unabated energy as during the previous year; occasional small patches have been found in every part of the gold field, but nothing continuously payable. That there are valuable auriferous deposits in these plains is certain, and nothing but the boring-rod will discover their whereabouts.

M'Guiggan's lead on the north bank of the creek is exhausted, with the exception of four claims that may afford employment to the original occupants for some months longer. There are still sixteen parties scattered along the lead, the majority of whom are reworking portions of abandoned ground.

The third prospectors have obtained this year 1,050 ounces of gold from their claim, and have still six months work.

The second prospectors have procured 438 ounces 18 dwts. 14 grs. from their claim during the year, the total produce of their ground being 1,209 ounces 11 dwts. 19 grs. Other holdings upon this lead, now abandoned by the original proprietors, have in the aggregate produced about 2,500 ounces since the 1st of January, 1875. The village is much reduced in size, and most of the houses have been removed to the Tichborne or elsewhere. Notwithstanding this falling off the surrounding country is highly auriferous.

The London: There has been no further extension of this lead. Blocks from Nos. 14 to 19 are still worked, and wash raised that yields from 7 to 14 dwts. per load. Its tributary, the Little Wonder, is, with the exception of two claims at the junction, abandoned. These latter have been highly productive, the wash being from 3 to 7 feet in thickness; the depth of sinking is about 15 feet greater than on the main lead. It is thus evident that these claims are on a separate run that has been traced to the deep ground (175 ft.) in No. 23. This latter has not proved payable, although wash is abundant. This portion of the gold field is of a sandy, porous description, and retains water for a very short period. At present the eight working claims have an aggregate of 6,000 loads of wash to grass awaiting rain.

The boulders raised with the wash from Nos. 14 to 19 are abundant, and consist entirely of nodules and blocks of a compact rich iron ore. The miners report to me that large masses of this ore are of frequent occurrence in their drives; these they work round. I have also been informed that a lode of the same ore crops out on the surface in the scrub to the eastward of the lead. Limestone has also been obtained at a considerable depth in the locality. The remainder of the lead is unoccupied, chiefly on account of the absence of water for mining purposes.

The village of London is nearly deserted, and the houses removed.

The Ben Nevis, never very productive, is in the same state as at the close of last year. The deepest ground is now ascertained to be in the centre of its length. Six claims, parallel to Nos. 14 to 19, on the London lead, are now being worked, and about 2,000 loads of wash await a rainfall. What is known as a tissue bottom has been found on some part of this lead, and beneath this, at a depth of 203 feet, limestone occurs. The portion of both the London and Ben Nevis leads, now the scene of mining operations, is in a belt of country about three-quarters of a mile wide. The quartz reefs above these leads are numerous, but have not yet attracted attention.

A number of small and unimportant leads in the vicinity, including the Band of Hope, the Gulgueys, the All Nations, and the Sydney Clinkers, are now abandoned in consequence of the scarcity of water either for domestic use or mining purposes.

The main Welcome lead, the Victoria lead, Donald's Gully, Paddy's Flat, Richardson's lead, Tearaway Gully, the Opossum lead, Reid's Gully, the No Mistake lead, with the surfacing at the Frenchman's lead, and also at the head of the north branch of the Bushman's lead, are all believed to have been exhausted by the first occupants. Upon each of these leads and workings, at long intervals, there are a few parties employed upon the abandoned ground. These can always earn a subsistence when water is available at the nearest puddling-machine but the poverty of the wash and headings will not admit of cartage to a considerable distance.

The Bushman's lead and its tributaries are in the same state as at the end of 1874. Several parties are still content to work the abandoned ground for small wages, and will continue to do so until they can obtain more profitable employment. The Great Northern lead, now proved to be a continuation of the Bushman's, is still an enigma; it has been followed during the present year from the west to the east bank of the Goobang, thence up stream for some distance, when, returning to the western side, after a further northerly course, it enters the lagoon or basin formerly described, 92 feet below the surface, and 70 feet below the present creek. This lagoon has been found to underlie a considerable area on the west bank, extending from the place on the east bank, where it was first discovered. It contains a wash from 2 to 7 feet

in thickness. 120 miners have been working without intermission upon this portion of the gold field for the last two years. The yield of gold from these workings during the year, has fluctuated between 5 and 14 dwts. per load,—the average is 8 dwts.

The broad course of an ancient channel has thus been followed for a considerable distance up stream to the lagoon, now covered by alluvium to the depth of from 92 to 98 feet; beyond this point the course of the old stream has not been discovered, and as yet has been but little sought for.

To the south-west of the lower end of the Welcome lead is an auriferous range, the southern slopes extending to the Goobang Creek. This ridge terminates at the head of M'Guiggan's lead; along its crest, on the south side, are a number of quartz reefs; these have not been proved up to this date, although all the usual indications of gold are present. Below these reefs occasional patches of gold-bearing surface are found. The Nibbler's, the Growler's, and the Well-trying leads were discovered upon these slopes in 1874, and have been worked out. A few scattered parties may be found still fossicking in the abandoned claims.

At the south-eastern end of this range, within the past month, an additional lead has been opened that gives employment to 150 miners. This lead descends to the creek, and thence runs upwards along the north bank for about a mile and a half. The depth is from 45 to 90 feet; the thickness of wash, 12 to 20 inches. About fifteen parties are on gold. The prospects are from 2 to 12 grains per dish, but irregular. It is probable that this lead will fall into No. 19 of the Welcome. This claim was very rich, as well as all those below it that were near the site of the present stream. There will then be a lead following the upward course of the creek for 3 miles. The Welcome was not worked further in that direction in consequence of water. Half a mile beyond the last shaft a high ridge descends to the creek, on the north bank; if the old channel is continued so far it must here cross to the south side, and probably will be found at no great distance from the channel of the Goobang. The ground may be deep and wet. The richest portion of the Welcome lead was that along the margin of the Goobang Creek. From the foot of the Welcome to the foot of the Bushman's, following the course of the creek, is a distance of about 5 miles, and the deep channel between these places might be traced without encountering more than the ordinary difficulties that attend such operations. It is perfectly clear that all the most auriferous ranges and leads have been surrounded to the southward and eastward by a deep ancient channel that received their drift and drainage; this channel discharged its waters from west to north for at least 12 miles of its course; the present channel discharges its stream from north to south-west. The old channel has been partially followed into the lagoon, and the continued prosperity of the gold field is in some measure dependent upon the success attending further research in that direction.

About the same time a lead was discovered half a mile to the northward of the Dayspring ridge; this lead having a westerly direction has been occupied about a mile and a half in length, passing across a conditional purchase but recently made. The depth of sinking is from 27 feet at the centre to 36 feet at each end. The prospects obtained are irregular, and vary from 2 to 12 grains per dish. The wash, so far as has been yet discovered, is narrow and thin. The bottom is a hard slate. Further to the westward in the same series of gullies, gold has been obtained in patches, but no continuous lead of any value has been yet found. There is, however, sufficient evidence of the existence of valuable deposits of gold on this part of the field. For some miles further north the country presents all the indications of a rich gold field. The Young Australian, the Stockman's, and other auriferous quartz reefs are situated in that direction; also Sparling's Camp, and many other places where gold has been obtained. This portion of the district appears to have been covered with basalt of a very early period. Evidence of this may be traced in the transmuted and altered rocks of the slopes and valleys and the basaltic crests of the ranges. The prospector has left but few traces in this locality for miles round.

The range to the north of the valley, containing the lead last mentioned, is 200 feet higher than any other upon the gold field, and consists of an augitic basalt. A broad belt of this rock has flowed from north to south, and where it has been removed by denudation on the Dayspring ridge there are some distinct traces of an ancient river. The plains to the

southward are lower than these basaltic ranges, and to what extent the decomposition and removal of the basalts may have affected the drainage of the district is a matter for study and consideration.

Within this district there is evidence of the existence of the rivers of three periods. The first anterior to the great basaltic overflow. The second was formed during the erosion of the valleys, and the decomposition of the basaltic masses; and the third are of comparatively recent date. The two latter affect the alluvial miner.

A drought extending over the whole period between the early part of August and the 31st of December last has seriously retarded mining operations, more particularly prospecting in new country, as there is no water to be procured for mining purposes within a large area; in fact it can now only be obtained in the Lachlan River, the Billabong Creek, and a few small reservoirs that are either private property or reserved for domestic use. The consequence is that there are now at least 12,000 loads of auriferous drift on the surface awaiting rain. Estimating the average yield of this wash at 6 dwts. per load, an additional 3,600 ounces of gold would have been added to the quantity transmitted by escort during the last quarter had the season been more propitious. This drought has also prevented the working of poor and abandoned ground, and thus thrown many out of employment who rely upon the deserted claims for the means of subsistence. This description of mining is frequently the sole means of present support for men engaged in deep sinking upon new ground. Having a thorough knowledge of the history of the abandoned workings, they usually know where a little gold has been left by the former occupants; temporarily holding these patches they work them during their spare time, often at night, and are seldom interfered with. The drought has deprived them of this resource.

Within the year under review no new discoveries of any value have been reported. A fifth deep shaft has been sunk on the plain to the eastward of Tom's Knoll, and driven about 200 feet; gold was obtained, but not in payable quantities; it is now abandoned. Pyke's prospecting party of six miners have been searching for a lead at the base of the granite range at Eugoura since July last; at depths varying between 150 and 190 feet they have obtained gold, but not continuously payable. A third party is prospecting to the eastward, at Bartlett's Creek, near the conglomerate formerly noticed. Here also a little gold has been procured, but not payable. Other parties are from time to time reported to be searching in more distant localities, with a like result. The enormous extent of the area over which gold is distributed in small quantities is not in favour of the prospector.

To the northward a few claims are still being worked upon Strasburg's lead outside the private ground; the result is an irregular yield of from 7 to 10 dwts. per load, the auriferous drift being thin detracts from their value.

The new lead at the foot of the Welcome continues payable; there are a few claims that yield from 8 to 10 dwts. per load; the wash is about 20 feet wide, and averages 9 inches thick.

An attempt has been made to trace some of the minor leads on the north bank of the Goobang, across the creek to the south bank without success. It is suggestive that all these small leads on the north bank should be traced at a depth far below the bottom of the present watercourse to the margin of that stream and then disappear. If these leads have been cut through it must have been by an older channel of drainage than the existing creek.

About 2,000 tons of tailings obtained from puddling machines have been crushed by the Ben Nevis plant; the produce was 1 dwt. 12 grains per ton. This experiment is of no value as a test of the quantity of gold lost by these machines, it must be sought for in the sludge.

A movement has been made by a party of miners towards the formation of a company, having for their object the construction of a race to convey a stream of water from a distance of about 15 miles to the abandoned workings upon the Billabong Gold Field, for the purpose of ground sluicing various areas of shallow auriferous deposits that have been but partially worked. Having examined the proposed course of the race along its whole length, I am of opinion that its construction is practicable, provided that the site of the main reservoir is of sufficient elevation, and that reservoirs are constructed along the course of the race for the conservation of storm water. It does not appear that more than from four to six months supply of water could be relied upon during any one year; this would depend upon the rainfall, as it would require a larger stream than that which usually flows down the upper

Goobang, to deliver a ground sluice-head at the foot of a race 15 or 20 miles in length. The promoters have made application to the Department of Mines for so much assistance as may be necessary to determine the relative heights of the proposed main reservoir and the southern termination of their race. As this service will require engineering skill and some expenditure it ought only to be performed upon security being given for the completion of the work or repayment of the outlay.

Works of the foregoing description have been projected and completed by miners with beneficial results, both to the projectors and the general mining interest. Had it not been for the races at the Hanging Rock and around Nundle the Peel River Gold Field could not have sustained its population for so many years. The auriferous ground high above the river could be worked by no other means than by streams brought from the table land.

Quartz-mining has not been prosecuted within this district with any energy during the past year. The reefs and veins are still neglected, as the miners seem indisposed to undertake anything that does not give promise of an immediate return for their labour. We still suffer from the effects of 1872, not by the loss of either capital or mines but by the demoralization of our quartz miners, who seem to have acquired a distaste for continuous labour.

Arrangements have been made for resuming operations upon the Bushman's reef, and an extended claim of 1,200 feet has been taken up upon Strickland's reef, from which, at a depth of 95 feet, some very promising stone has been obtained, containing large quantities of pyrites. This reef, or series of reefs, is 2 miles in length, and has been profitably worked in old times. It is 5 miles due south from the reefs at the Wapping Butcher; in fact Tom's Knoll is an outlier from the slate range that carries Strickland's reefs.

The proprietors of the extended claim referred to have recently crushed 90 tons of stone, and obtained therefrom about 10 dwts. of gold per ton. The stone exhibited a much greater quantity of free gold, but it also contained iron and arsenical pyrites in veins and detached masses.

Two samples of quartz obtained from the reef under consideration at a depth of 95 feet, were transmitted to the Department of Mines for assay. The reef at the depth indicated was 3 feet 6 inches wide, and associated with another in which the quartz is of a somewhat different character and less auriferous. The fissure was nearly vertical, the walls soft slate, and the line of strike north and 10 degrees east of south.

One of the samples consisted of about half its bulk quartz, and the remaining half of sulphurets, arsenical pyrites, iron pyrites, and a little galena, no gold visible. On assay this specimen was found to contain gold at the rate of 1 oz. 10 dwts. and 1 grain per ton, and silver at the rate of 1 oz. 19 dwts. and 4 grains per ton.

The second sample consisted of quartz with but little sulphurets, the latter having been decomposed and replaced by peroxide of iron, coarse gold visible. The result of assay was at the rate of 4 ozs. 6 dwts. and 6 grains of gold per ton.

It will be observed that in these two samples the stone taken was alike in every respect, with the exception of the fact that in one portion of stone the sulphurets were in a perfect condition, and in the other they were decomposed. The important question is *how has this decomposition been effected.*

I am indebted to the Geological Surveyor for a description of the samples referred to with the result of the assay.

The difference between the quantity of gold obtained from the crushing plant and that indicated by assay has probably been lost in the process of extraction. One of the shareholders remarked to me that it was like an attempt to crush tar.

The shareholders in the claim referred to continue to raise stone, but the other claim-holders upon the reef appear to be awaiting the result of future operations.

The claimholders on the Welcome Reef have recently had a trial crushing of 20 tons of quartz raised from a depth of 60 feet, from which they obtained 8 dwts. of gold per ton. The tributers on the Bushman's Reef are still raising quartz from a narrow vein, and there is a remote prospect of the Dayspring property being rented to a company with a right to purchase. The remaining reefs are unworked.

Work upon the Dayspring reef has for the present been discontinued.

A few tons of tailings, or rather forkings from the puddling machines, have been crushed. The result was not profitable.

Iron ore from the London lead has also been crushed with a view of obtaining gold therefrom. It was a failure.

There are numerous reefs and veins of quartz upon the hills and ranges; some eighty of them are known to be auriferous; below many of these are large areas of gold-bearing surface. You may stand upon one of these elevations and see miles of worked and exhausted leads meandering round its base, the white piles of earth stretching away down the valleys until lost in the distance, and yet but few of these reefs have been proved.

It may be urged that the alluvial gold obtained from this field is coarse, and would be visible in the stone. To this I reply that a scarcity of water is the great difficulty that the miners of the district have to contend with. Gold here has always been separated from a wash, the chief portion of which is stiff clay, by means of puddling machines, and the finer particles of metal have been carried off in the thick puddle, through which it is impossible that they could sink; they may now be found in the 300,000 loads of sludge that surround fifty-one puddling machines, or down the Goobang Creek. The miners have only saved the coarse gold.

Many of the reefs that have been tested contain a small quantity of free gold associated with arsenical pyrites and galena, the latter in small quantities. *Near the surface, these components are more or less decomposed*, and the sulphurets are replaced by peroxide of iron, and when this decomposition has taken place free gold may be more frequently observed. As the reefs descend, decomposition ceases, and in some instances free gold disappears. The decomposition may be due to the percolation of rain water from the surface and may extend no deeper than it can penetrate. This may account in some degree for the fact that the reefs of this district have always proved to be most productive near the surface, or in the immediate vicinity of an intrusive dyke, between which and the originally softer rocks that form the walls of its fissure water charged with carbonic acid, soda chlorine, and other chemical agents may find its way to a great depth.

There appears to be increasing disposition amongst miners to devote more attention to the extraction of gold from the matrix. It will however require some instances of marked success to induce them to form co-operative companies and recommence mining operations on the reefs and veins in this district. I have full confidence that sooner or later they will be profitably worked.

Of the six quartz-crushing plants upon the Billabong Gold Field, one has been employed during the first half of the year; one has been dismantled, and a portion sold; one has been used as a saw mill; and three unemployed are held in reserve for better times.

With reference to the supply of water for mining purposes it is the same as at the date of my last report.

The number of puddling machines have been slightly increased, and several have changed sites; there are fifty-one, many of them dependent upon storm water and catch races; this water is used over and over again as long as it remains fluid.

From the character of this gold field no extensive mining operation has been yet found necessary that would require to be specially described.

The eight mining companies are still inactive; vegetation is prolific upon their respective properties.

Statistical returns, in detail, will I presume, have been transmitted to the department by the proper officers.

As it is not now compulsory upon prospectors to register their areas, it is impossible to ascertain their number. The reward offered by the Government for the discovery of new gold fields has stimulated these pioneers, but has caused them to be more secret in their operations.

It is desirable that a boring-rod should be supplied for the use of prospectors under certain conditions. Without the aid of such a machine the deep ground will not be efficiently prospected on the plains. It may be said that mining is a private enterprise and should be stimulated by private capital, but this does not apply to gold mining. The prospector for the time being devotes his energies and labour to the public service; any stander-by may deprive

him of the result of the labour of months. As a marked instance of this I refer to the prospectors of the Tichbourne lead, surrounded by untold wealth they obtained but two penny weights of gold. This claim should have been named Pisgah.

For a time there would be full employment for an experienced mining surveyor upon this field, but the services required from him would be chiefly of a public nature. Every water-course should be plotted on a large scale, with sections to the bed rock where possible; also shafts on quartz mines, with the strata cut through in the descent. Every ridge and valley below the surface in proved payable ground should also be plotted, with frequent sections to the rock, and that rock accurately described. Every indication of an ancient channel should be noted, and sections should be made of all important prospecting shafts on the outlying portions of the district, whether prizes or blanks. The surveyor should also examine, prove, and report upon every discovery of gold in a new portion of his district. The miner, sometimes incompetent, at others over sanguine, often reports ground payable that is not so; he is more frequently disposed to withhold information for speculative purposes, and cannot in every instance be relied upon; he may be disposed to transfer his interest, or he may have cogent reasons for concealing his want of success. The miner will continue to grope his way in the dark until something of this kind is done, and made accessible to all.

Upon the whole, excluding the exhausted leads from consideration, mining operations upon this gold field have during the past year been conducted with energy, and attended by success. Our yield of gold has been steadily increasing year by year. My anxiety at present is for the discovery of one of those many leads, by which we are still surrounded, so that the population may be fully employed and retained in the district.

By some accident Grenfell has always been associated with Parkes in the returns from the Mint. There is no connection whatever between the two places, which are 66 miles distant from each other, and Grenfell thus gets credit for a wealth that she has ceased to possess. It is true that at the close of 1866 she borrowed a few hundred miners from the Billabong that were returned with interest in 1871. These are but neighbourly reciprocities that ought not to give one gold field any interest in the property of another.

About one-third of the mining population on the Billabong have migrated to Mandurama and elsewhere; those remaining do not number more than 4,500, quite sufficient to open two or more leads should they be discovered. The largest exodus has been from the London, M'Guigan's, and the Tichborne. Since the opening of this gold field the inhabitants have experienced many periods of depression that have been invariably succeeded by seasons of great prosperity; it has been but the interval between the exhaustion of one lead and the discovery of another.

The area of worked ground has not been extended during the past year.

The quantity of gold obtained from the Billabong Gold Field during the year 1875 was as follows:—

	ozs.	dwt.	grs.
Transmitted by Police Escort between the 1st of January and 31st of October	49,245	6	20
Do. do. between the 1st of November and the 31st of December	9,072	3	5
Held by the Banks at Parkes and Tichborne on the 1st of January, 1876	1,900	2	6
In private hands, and transmitted by private conveyance at various times	1,800	0	0
	62,017	12	7
Less the produce of 1874, in the hands of the local Banks on the 1st January, 1875	4,165	18	14
Net total.....	57,851	13	17

Being 6,690 ozs. 7 dwts. and 13 grains in excess of the yield from the same leads during the year 1874.

The yield of the Billabong Gold Field between the 1st of January, 1871, and the 31st of December, 1875, has been 164,012 ozs. of gold, which at £3 15s. per oz. has realized £615,045. The Billabong miner has thus by his industry created a market for the farm produce of the western interior to a proportionate extent, and given an impetus to the sale of Crown Lands within a radius of 70 miles round Parkes that has advanced the settlement of the district half a century. Estimating the average population upon this gold field at 4,500 during the five years ended on the 31st of December last, and the expenditure of each individual at 10s. per week, they have put £585,000 into circulation—that is to say, more than half a million of pounds sterling. The miner may exhaust the known leads and forsake the district for a season, but he will leave towns and farms where he found a wilderness.

FORBES.

During the current year, with the exception of the deep lead at the Bald Hills, which is now deserted, no mining operation of any importance has been prosecuted upon any of the gold-fields in the vicinity of Forbes, and nothing has been done to promote their further development. Several miners, who held interests upon the South Lead during 1862, have asserted that but few of the claims upon its southern portion have been exhausted, and have expressed a determination to reoccupy the ground,—but still they hesitate. That there is a large area in that locality in which there is a wash of from 3 to 7 feet in thickness, with an average width of 50 feet, and that will yield from 7 to 10 dwts. of gold per load, is admitted by most of those who formerly worked the ground. The depth is from 200 to 250 feet, and the miner before he can reach the wash must encounter quicksands, water, foul air, and a swelling bottom. It is a full knowledge of these difficulties that deters those who do not possess capital, but whoever does surmount the obstacles that will present themselves at the commencement of such an enterprise, will find the ancient channel of the Lachlan River before him, winding through the vast alluvial plains, intersected by the present stream. These plains have received the drifts of an enormous portion of the western interior. Nothing remains of many a range to mark its former site but a huge pile of naked granite boulders; and from the great depth of the alluvium of these plains, it appears to contain as large a quantity of disintegrated and decomposed basaltic and other formations as would refill every valley and recover every range within the district.

On the Madman's Lead a party of miners have, at a depth of 100 feet, struck a bed of wash 3 feet in thickness. From one bag of drift they obtained 16 dwts. of gold. This may serve to direct attention to that portion of the gold-field.

There are other portions of the field that might be worked and mined upon with less difficulty than the locality referred to, but the prospect of obtaining gold would not be so certain.

Matheson's Lead, at the Bald Hills, the last occupied under the old frontage system, is 175 feet below the grass; and to the extent of half a mile north and south of the prospector's a great deal of work has been done upon it. Shaft after shaft had been sunk upon each area when No. 1 South struck gold; then No. 1 North; then Nos. 2 and 3 South. The lead proved to be narrow and irregular, and the wash thin. Some good prospects were from time to time taken off the bottom. Thus encouraged, a puddling-machine was erected, when the wash yielded an average of 10 dwts. of gold per load. This was deemed not to be payable, and work was discontinued in all but two claims. I am informed that the prospectors exhausted a length of 200 feet on the base line for 140 loads of wash. This is either the head or tributary of a lead that will eventually be discovered, when it is probable that the wash may be found in greater quantity. The gold obtained is light and inferior in quality to any yet won in the district; it resembles bad copper. This is some evidence of its being a distinct lead, and of no part of it having been mined upon at an earlier period.

I am not aware of having previously stated that about four years since a party of Chinese miners were occupied for some two years upon this gold-field in passing the sludge found in a puddler's reservoir, on the South Lead, through a machine of a peculiar construction. The model was brought from Victoria. After puddling with extreme care they ran the puddle over three shaking tables, each 4 feet wide and 14 feet long, and each having a separate and distinct motion; they also used blankets and quicksilver. Half a tea-cup full of gold,

shown to me, that had been saved without the use of quicksilver, was so fine as to have lost its metallic lustre. The gold won was sold to the Australian Joint Stock Bank, or the greater part of it, and the party appeared to be satisfied with the result of their operations. They were under the direction and control of one of their number, and eventually broke up when they returned to China. Such portion of their plant as was movable disappeared with the party.

The only crushing plant upon this gold field has been unemployed during the year until the last week. It is now working for the extended claimholders, on Strickland's Reef, 8 miles distant from Forbes. Many anxiously await the result. The puddling machines up to this date have been idle.

Up to this date 375 applications for leases of auriferous tracts for mining purposes have been made through my office; of these 286 were from the Forbes, Billabong, and Cudgellico Gold-fields, and eighty-nine from Emu Creek. Of the gross number 354 have been applied for under the provisions of "The Gold Fields Act of 1866," and twenty-one under "The Gold Fields Act of 1874." Seventy-seven (77) leases have been transmitted to this office for issue; five have been issued, eight are still on hand, and sixty-four have been returned to the Department for cancellation or issue in Sydney.

With reference to mining for metals other than gold I have no report to make, as I am not aware of any mining of that character being carried on within the district under my charge. That copper and iron ore abound in the dry country to the north-west of Forbes is well known, also that auriferous reefs are not of unfrequent occurrence; but the markets are at present too distant, and the inducements not sufficiently strong, to tempt any but the gold-miner in that direction.

LACHLAN DISTRICT.—SOUTHERN DIVISION.

(Mr. Warden Robinson, P.M., Young.)

I HAVE the honor to report to you that gold mining operations in this "division" are scarcely marked by any new feature during the past year. As far as I can gather, during the short period I have held the office of Warden, the same remark may be justly applied to the whole of the "Southern Division." There is, however, this difference between the past and present year (1875), that the effects of the mining excitement of 1872 have comparatively died out. There is now a fair amount of capital ready for investment in mining, and, I may add, a strong desire is exhibited to enter into legitimate mining ventures. Labour is, however, not obtainable. All other industries are flourishing, not only in Young but in every place throughout the district; hence it is that those who will work for wages prefer steady employment to the more precarious engagements usually made in connection with gold mining. I don't think it can be reasonably doubted that but for want of water-supply a marked improvement would have been shown in this division during the last quarter of the past year.

There are ten alluvial sluicing claims in Burrangong in active operation when water is obtainable, which give employment to about fifty persons, most of whom are proprietors. Leaseowners of "plant" express strong desire to extend their works by erecting dams and cutting races, but the price and scarcity of labour operate to completely bar their efforts in that direction. Other descriptions of mining in this division for the present have either been abandoned, or are registered under suspense. Besides the scarcity of water and absorption of labour in interests other than gold mining there is a large withdrawal of miners from their legitimate occupation in those—and they are many—who have an insatiable desire to get freeholds—by conditional purchase (purchase by virtue of improvements). I may here remark that in a large majority of cases I have found when these applications are sent in there is not one shilling's worth of improvements made on the land so sought to be purchased. These are the persons that comprise the body of fossickers, and as a rule mine without either leave or license.

For some time past there have been several parties, mostly composed of practical miners, out prospecting. One of these is now testing new ground, with a good prospect of developing a gold-bearing quartz reef. Besides this, arrangements are about being completed to erect two puddling machines on an extensive scale, adjacent to the township. A company

is also in course of formation which purposes working a large breadth of the abandoned alluvial ground in Chance Gully. The claims at this place were once considered to be the richest about Burrangong. The mode of working proposed is to sink shafts, and by machinery keep the underground current of water clear, which flows too copiously to be contended against by manual labour. The party who has been cutting a drainage-race for working the old ground at Poverty Gully and Possum Flat are still hard at work. Much time and labour will yet be required before practical mining can be proceeded with. Johnson's quartz-reef has been abandoned. It has been forcibly put to me, by more than one intelligent miner, that when public confidence in mining matters becomes quite restored the best alluvial grounds hereabout will have passed into private hands unless reserves be made. This, in the opinion of the persons I allude to, can only be done after a geological survey has been made, and that such surveyor should be the person or officer to point out the portions that should be withdrawn from sale.

At Murrumburrah there are only two or three ground sluicing-claims being worked. The quartz reefs in that quarter are still, by competent judges, held to be very rich—one day or other these reefs will be worked with great profit. The Company that was floated during the mining mania to work one of these claims was got into the market upon the terms of *that* day, which proved so ruinous to many other persons and properties. When public confidence becomes restored I have no hesitation in predicting that the reefs at Cunningham Creek will be worked most extensively and with profit to those who may judiciously invest capital in the undertaking. On the Bland there are two quartz reefs, "The Ada" and "Barmadma," each of which have 1,000 tons of stone to grass, and only want a water supply and new machinery to go on working on an extended basis.

Grenfell.—In this district, like Young, during the year, it cannot be said that there has been much falling off, neither has there been any re-action in gold-mining. At no time, during the past twelve months, has there been 150 diggers working at one time. At present there are about thirty-five men engaged in ground sluicing, and, all told, 48 persons occupied in quartz reefing. Taking the above as compared with the previous quarter there is a falling off to the extent of twenty men. The whole mining interests of Grenfell are just now centered in the operations of "The Consols Claim," the main shaft of which is now down 730 feet. The Company are getting no gold but actively employed sinking with the expectation of striking the "Reef" at a greater depth. If their expectations be realized it will be the means of inducing capitalists to set about opening up a number of reefs which have from time to time been discovered in the immediate vicinity of the Township.

SOUTHERN DISTRICT.

(*Mr. Warden De Boos, Braidwood.*)

Though appointed Warden for the Tumut and Adelong, as well as for the Southern Mining District, I have been more especially entrusted with charge of the latter, and shall therefore confine my report to that district, although during the early part of the year I twice visited the former.

At the outset I have to state with regret that the whole of the Southern Mining District has been languishing during the past year, the mining population having sensibly decreased, and as a consequence the yield of gold fallen off. More than one cause has been in operation to produce these results; but without doubt the main cause has been the remarkably small rainfall of the present year. The mining operations of the district are, with very few exceptions, confined to sluicing, and no miner has a chance of setting in profitably to work upon any of its fields unless he be the owner of a race. The winter having been an exceptionally dry one, none of the races have been running for any appreciable length of time with a sufficient head of water to allow of ground-sluicing being carried on to any great extent. Thus miners have been forced down into the main streams to work such portions of the banks as may be attainable from races drawn from the stream itself, instead of working, as they otherwise would have been, upon the better paying ground lying at a distance from and much higher than the river.

Owing to this a comparatively small area of ground only has been available to the miners, and it is not to be wondered at that some of them, being unable to set in upon ground to which they have been accustomed, should have turned their attention to other districts or to other pursuits. Thus some have gone to Parkes, to Gulgong, or to other places, whilst others have left mining for a time for work of a cognate character, hoping to resume it hereafter under more favourable auspices. Then again, a great deal of labour prevails in the interior, there being more especially a demand for that kind of labour peculiar to the miner. Many have, consequently, been tempted, under the circumstances stated, to engage themselves on the railway extensions, and on works of a similar character.

Thus much as to the mining welfare of the district generally; and now to come to particulars: The limited rainfall, which has been so disastrous to many localities, has however been of advantage to others, which in times of heavy rain or floods are surcharged with water to such an extent as to set machinery at defiance. Of these there are two instances in this district—the Shoalhaven bank claims and Araluen.

With regard to the former, nearly all the bank claims along the Shoalhaven, from the junction of Back Creek down to Nerriga, a distance of quite 50 miles, have been profitably worked, with only brief intervals, during the year. Some of the claims which are worked by means of races, supplied from tributaries of the river, have only had partial employment; but on the whole the yield of gold from this quarter has exceeded the average, and has been fairly remunerative to the miners employed. In some instances it has been largely so, some rich deposits having been struck near the Bombay crossing, commencing at the bank and running north-westerly into deep ground, giving every indication of an old river-bed. This, with the corresponding find of an old river-bed on the edge of the limestone country, on the Shoalhaven Sluicing Company's ground, led as much as anything else to the anticipation that this old river-bed had its course somewhere in the direction of the ground at Warri, in which Cunningham reported to me that he had found gold.

Some of the races used in working the river are very extensive, and have been constructed at very considerable expense. Of these I need only allude to the two most important, that of the Shoalhaven Sluicing Company and that of the Warri Sluicing Company. The latter is over 20 miles long, and was made at an expense of some £1,400 or £1,500. It has not been at work for some time past. The former, which heads from Reedy Creek, is 24 miles long, 2 feet deep, and 3 feet wide at the bottom and 4 feet at the top, with about 8 or 10 miles of branch races brought to different points. The water was first run through it in April last. The main race is brought on to the top of the range, which borders the river, at an elevation of about 200 feet, thus commanding a large extent of sluicing ground, and giving a large amount of fall for hydraulic purposes. The country worked is the hills on the western side of the river, and about 4 or 5 miles below the Larbert crossing. These for over a mile back from the river, and up to the edge of the limestone country, are all made hills, thickly covered with river drift, and within half a mile of the river have been found payable to work even by those who have had to cart their wash-dirt to water. The old river-bed, to which I have referred as having been found in the company's ground, was struck in the ridges on the southern side of the Limeburners' Creek. Owing to the quantity of underground water no shaft has yet been bottomed here, the greatest depth obtained having been 45 feet. By working up to it from below the manager hopes to drain the ground as he goes on. Should the company be successful their success will be of great advantage to the district, as it will be calculated to induce others to go into similar extensive operations upon other portions of the river bank.

From the examinations I have recently made of the banks of the river on either side I can say that in very many places the made hills, similarly covered with river drift, extend back from the river for fully a mile and a half, giving every indication of good sluicing ground. They attract the attention of every experienced alluvial miner who passes over them, as well from their peculiar character as from the thick coat of drift with which their surface is covered, and there is hardly a hill of the kind in which will not be found the traces of the prospector's pick and shovel. But, though thus tried and left, it must be borne in mind that that which would not pay the individual miner who has to cart his wash-dirt to water, would be handsomely remunerative to the race-owner who could bring water on to the ground, and make it do all his work. A little below the Horse-shoe Bend some two or three parties of men set in to

drive under the basalt, which here overlies the alluvial deposit to a depth of from 20 ft. to 30 ft., but the return was not sufficient to induce them to go on with work of so arduous, expensive, and dangerous a character, and it has been consequently left.

With regard to the number of miners employed on the river, it is difficult, owing to the extent of ground and the scattered workings, to make anything like a reliable approximation to it. Nor will the miners' rights issued help the matter, as owing to the isolation of many of the spots there must be many men at work who have no miners' rights. This is more especially the case with the Chinese working here and elsewhere, as there is no scheme or trick that they will not resort to, if by so doing they can escape payment. At a rough guess, however, I should say that there are close upon two hundred (200) miners, one fourth of whom are Chinese, working on the river. Nor is the yield of gold to be ascertained even approximately at present, for it all comes to the banks in Braidwood, where it is taken into account promiscuously with that from Little River, Araluen, Major's Creek, and Bell's Creek. I hope, however, to make such arrangements for next year with the Managers of the branches of the several Banks here, as will secure a correct return of the purchases of gold from the different fields in the district.

Araluen, being in the same position as the Shoalhaven, in so far as it requires fine weather for its profitable working, comes next in order. Araluen Valley, by which term I would designate the broad flat that extends from the foot of the Bell's Creek Mountain down to Crown Flat, can only be profitably worked in dry seasons, as the ground not being of a nature to allow of tunnelling has to be taken out in paddocks, the various strata of alluvial deposit overlying the wash-dirt having to be carted away; so that, with these extensive openings, the work from the cost of cartage and pumping is very expensive, and the claim after all the outlay is liable to be submerged by the first flood. At present there are only three large stripping claims at work in the Valley, two of them being on private ground,—the Great Extended, The Homeward Bound, and Newmans. Of the first of these I treated very fully in a former report, describing the mode of working by means of trucks travelling on a tramway laid on an inclined plane. The other two are working in the usual manner, carting away the top dirt by means of horses. They employ from twenty to fifty hands each. In addition to these there are ten or twelve smaller parties, working with from six to ten men each, between Crown Flat and the Junction with the Deua River. Above the Araluen Valley proper, in what is known as Upper Araluen, in the bed of the creek and the long jutting banks that run into it, and also amongst the short broken ridges that rise from its southern and western side down to the point where the Bell's and Major's Creek conjoin, a great deal of sluicing work is going on, the former on Crown, the latter mainly on private land. Here, as opposed to the Araluen Valley, a large supply of water is required, and as the men keep steadily at work it is to be presumed that they make sufficient wages to satisfy them. At the same time it must be said that the men employed here have made themselves comfortable little homesteads on the ground, and that this probably causes them to remain contented with less gold than would satisfy them elsewhere. Two reefs have been working here for a part of the present year, one on the Major's Creek side of the Sugar-loaf Mountain, and the other, known as the Sideing Reef, on the Deua River; neither is at present working.

The number of miners working upon Araluen waters, that is, from the head of Upper Araluen down to the junction with the Deua, cannot be far short of (500) five hundred, of whom about two-fifths are Chinese. Very nearly the half of the number is employed on private ground. For the reason given in the case of the Shoalhaven workings I am not in a position to give you the actual yield of gold from this field, although I trust to remedy this defect in future.

First in importance amongst the gold fields that require a large and constant supply of water to keep them going is certainly that of the Mongarlowe or Little River. This includes not only the Little River but its tributaries—Warrambucca, Tantulian, Sergeants, Plajeur's, Bobs, and Mettleton's Creeks, all of which have proved more or less auriferous. During the dry season the work on this field is confined to washing the river banks, the river itself supplying sluice-heads for the purpose; but in wet weather, when the tributary creeks are running freely, the high races are brought into work, and a good deal of the back country and the higher hills which border the river are ground-sluiced. In fact more money has been spent

here in the construction of races than in any part of the Southern Mining District. There are in all about 170 miles of races on this field, and the race of the Warrambucca sluicing-Co., formerly described by me, has no less than 1 mile 300 yards of fluming erected. In ordinary rainy seasons these races pay very good dividends, the ground being in all cases easily sluiced and often exceedingly rich. In addition to the alluvial workings there have also been some ten or a dozen reefs opened on this field. Some of these have turned out wonderfully rich stone, rivalling even the richest finds of Hillend; but the rich stone only ran in veins through the reef and never stood out long. None of the reefs are at present working. In most of them water has been encountered at about 40 feet down, and no pumps yet brought on to the ground have been able to keep that water down. Besides this the slate walls get very hard at about 20 feet below the water-line, and only one or two shafts have been put down into the hard rock. One, on Burrell's reef, was put down 150 feet, but it was ultimately deserted. Some parties, however, have recently been prospecting in this shaft above the water-line, but I have not heard that they have regularly set in to work.

On this field about (850) three hundred and fifty miners find employment, the half of them being Chinese; and the yield of gold is not to be ascertained as it all goes into account in the Braidwood returns.

Next to the Little River the Major's Creek or Elrington Gold Field claims attention. This field includes the workings at Major's Creek, Long Flat, and Back Creek. At the first-named the work consists almost exclusively of what is termed "flooding off." This can be done only at times when the races are full of water, and consists of turning the whole force of a strong stream upon some portion of land abutting on the creek or some of its tributaries, until it is washed away down to the bed rock. After this washing away or "flooding off" has gone on, as long as the water lasts the tail race is cleared up and the gold collected. In this way the banks of and the points of spurs coming into the creek are washed down as long as payable prospects are obtainable, sometimes to a height from the bed rock of 80 feet and over. Only very little sinking is carried on, as nearly all the ground in the creek has been tested and fairly worked out when found to be payable by this kind of work. After having been thus worked it falls into the hands of the flooders off, if by any means a stream of water can be brought to bear upon it. In this there is considerable difficulty, for though the Back Creek water would command the whole of the Major's Creek ground, so much land has been alienated at the upper part of the Long Flat, through which only can races from Back Creek be brought on to Major's Creek, and so high a figure is demanded by the owners of the ground for liberty to cut races through it that Back Creek lies virtually shut up against the Major's Creek miners.

Long Flat is in a somewhat similar position to Major's. The ground has been worked out for some considerable time, and the only work going on consists of puddling over the old headings and ground sluicings among the short low ridges that divide it from Major's Creek. The upper part of the Flat, unmistakably part of the Long Flat Creek watershed, has by some means been alienated; and now, the miners having worked up to the fence which divides the Crown from the private lands, are forced to content themselves with puddling ground that in many cases has been worked over and over again, and to look with regretful eyes upon ground which they know to be auriferous, but which they are not permitted to touch.

Back Creek has been worked only upon the lower portion of its course where it comes down in close proximity to the Long Flat. It would, however, be valuable to the miners for the strong body of water which it carries if that water were available. Could it be taken over to Major's Creek it would enable the whole of the alluvial ground there to be washed, and would give employment to very many miners. Back Creek being closed to them, a project was set on foot to bring the waters of the Shoalhaven on to Major's Creek. The line of the projected race was surveyed some years ago by Mr. Larmer, the distance being about 80 miles, and in the early part of the year some Sydney gentlemen came on the ground with a view to taking up the project. The plan was in every respect feasible, but the work would have been an expensive one, and I fear that this has hitherto stood in the way. I have been given to understand, however, recently, that the project has not been absolutely given up.

With regard to the Major's Creek reefs, I have only recently written you full reports upon them, accompanied with specimens, and I now only regret to add that the copartners of

Darque's reef have knocked off work for the last three months; and that Field's shaft on the Snob's Reef has been somewhat hanging fire, owing to the difficulty experienced in finding some economical way of treating the stone in such a way as to secure the minerals it contains. In addition to these, two small veins of quartz, which were worked some three or four years ago, have recently been reopened in consequence of prospectors on them having come upon a run of gold. Crashings from one gave over an ounce to the ton, and from the other 17 dwts. to the ton. The veins, however, are only a few inches thick.

The number of miners on the Ellington Gold Field, including those working on private land, is somewhere near (800) three hundred, and about (60) sixty of these are Chinese. The gold from Major's Creek is all bought up on account of the Braidwood Banks.

Of Bell's Creek very little need be said, as not more than (20) twenty miners at the outside are working upon Crown lands, and these are all employed in sluicing. On the Bell's Creek private property some (70) seventy men altogether are at work; of these about a dozen are engaged in reefing, and the remainder in sluicing and flooding off. As regards the reefs I have so recently sent you a full report upon them that there remains nothing for me to add; and as to the alluvial mining it is precisely the same as that already described, depending for success upon a large and regular supply of water. It is, however, worthy of note that these miners on private property make no demur at paying £1 per month for alluvial mining; and for the right to reef £1 per month, or 10 per cent. royalty, at the option of the miner when making his agreement. The Crown lands are equally as productive of gold as the private lands, and if the miner can afford to pay this in the one case he cannot be so very badly off in the other, where only 10s. a year are required from him.

The Bell's Creek gold goes into account with that from Braidwood.

Descending the Deua River into the Moruya Division of the Southern Mining District, the first gold-field that is reached is Mogo. This field is situated in close proximity to Bate-man's Bay, the township, originally the centre of operations, being about 4 miles from the Bay, in a direct line, 11 miles from the Heads, and 10 miles from the cluster of habitations known as "The Bay," where the landing-place for the steamers has been established. Mogo Creek is formed by the junction of M'Leod's and Doctor's Creeks, and, with the two creeks named, has turned out in its time a large amount of gold. It is now regarded as worked out, but whenever a flood takes down any portion of the creek banks, men set in upon the spot, and still get a small amount of gold, though not sufficient to induce them to go to the expense of race cutting to perform the work now left to the floods. The few men now on the ground obtain their living by surfacing on the drift-covered made hills, which lie back from the creek. The wash is mostly discovered on the surface at different heights on the hills, and is then carefully followed by tunnelling into the hills, sometimes to a distance of 80 feet, until the wash runs out, the usual distance being from 6 feet to 15 feet. The wash-dirt is then taken down to the creek in bags to be washed, the whole being a cumbrous and primitive mode of proceeding that fully exemplifies the low ebb to which this field has come. The gold obtained is invariably coarse and nuggetty, often carrying nuggets of from 12 to 25 dwts. each. Sometimes shafts are put down on the hill sides, but none of these ever exceed 25 feet. If gold is not struck then another shaft is tried; if wash-dirt is touched it is followed in each direction till it runs out, which it does before very long, as the ground is exceedingly patchy. The reefs are entirely deserted, not a man to be found on the ground. When working, the crashings from the stone gave a pretty uniform return of 9 dwts. to the ton; but no greater depth has been obtained in them than some 85 feet, that depth being sufficient to carry the quartz down through the soft into the hard walls, and the toughness of the latter has been such as to put a stop to deeper sinking.

Not more than (10) ten men are now actually at work mining here, for though there are very many more miners than these living in the district, they have nearly all gone into timber squaring in the ranges, the large demand for squared logs which now exists giving more certain and probably more profitable employment than mining in old ground.

At Moruya mining has come to a complete standstill, for though several leases have been applied for on the reefs which have been opened up a short distance from the township, it is doubtful whether any of them will be taken up when issued. These reefs are situated about 7 miles from Moruya, on Dwyer's Creek, a stream which joining with Wamban Creek

forms Condoin Creek, a tributary of the Moruya River. The different lines of reef lie something less than half-a-mile apart, and are separated from each other by the windings of Dwyer's Creek. Highest up the creek is the Moruya Silver Mining Company's reef, from which at one time very great results were anticipated, but which proved a failure, simply from a want of knowledge of how to treat the stone economically. The reef is a very fine one, fully 4 feet wide, and the stone is full of metal (specimens forwarded), which shines out brightly even after years of exposure to the atmosphere. In some of the old heaps, which have been lying for the last seven or eight years exposed to sun and rain, the arsenic from the *debris* has exuded in very large quantities (specimen forwarded), making the heaps look as if a snowstorm had beaten on it. Within a stone's throw of the silver mine is a reef of auriferous quartz, from the stone of which as much as an ounce and a-half of gold has been crushed to the ton; and which, for several hundred tons, averaged 15 dwts. per ton. It was to all appearance a heavy blow or outburst of quartz fully 20 feet wide and 40 feet in length, but narrowing towards each end. This blow was followed down to a depth of 50 feet, but was found to pinch in gradually between granite walls. At the ends also the same thing occurred, the blow of quartz subsiding by degrees into numerous small veins, tightly embedded in very hard granite. There is still a show on the face of a pretty wide reef, but from its not having been followed with a crushing-machine within a dozen yards, I presume that the stone was not found to be payable beyond the points already worked. Next to these two reefs, and divided from them by Dwyer's Creek, is the Ranter's Reef; and again, with the creek intervening between each, the Donkey Reef, the Rotten Reef, and a series of thin surface veins lying horizontally and close together on the hill side, but dipping after two or three feet into tight hard granite walls. These veins, as long as they continued horizontal, were not difficult to work, and 10 tons of stone from them gave 11 ozs. of gold, but being only from an inch to an inch and a-half wide they became too costly to work when they reached the granite. All the other reefs named have been worked more or less extensively, but they have now lain idle for many months. On the bank of the Wamban Creek the Bergalia mineral reef is situated, but it has now been unworked for many years, and the fine plant that was erected on it has been scattered. Here, again, failure was due to the same cause as that which militated against the Silver Mining Company—the inability to treat the stone, though it was wonderfully rich in minerals.

I saw no men at work in this portion of the district; in fact, though many leases have been taken up here, and though Dwyer's Creek at one time had a population of over 200 miners, and turned out a fair amount of gold, this part of the country has never been proclaimed a gold field, and conditional purchasers are gradually closing in upon the gold-mining lessees.

Nerrigundah, more generally known as the Gulph, Gold Field has been gradually falling off during the last year. All the best portions of the ground have been worked, though there still remain large areas, which, with a copious supply of water, would pay well for sluicing. The general course of the Gulph Creek is about from west to east. Two arms or branches rising in the Bumbo Range join together and form the main creek at a distance of some 8 miles from the township. On the left hand or northern branch Stack's reef is situated, but no work is now doing on it. Near what was once the upper town, where the creek makes a sweep round a long low projecting ridge, the first main feeder (Sawpit Gully) comes in on the north side. A reef has been opened here; but a crushing of 100 tons about six months ago gave a return of only 6 dwts. to the ton—not sufficient to pay when the stone had to be packed to the machine. On the southern side of the main creek North's Creek and Graveyard Gully come in. In the former, two reefs have been opened (Pollock's and Tucker Hill), neither of which is now working; and in the latter, which closely adjoins the township, Bentley's and Bailey's reefs have been worked. Bentley's is idle, but Bailey's is still being perseveringly worked, and I was pleased to see a very good show of stone. A tunnel is being put in, and the stone shows a face about 5 feet 6 inches wide, between good well-defined slate walls, the hanging wall being rather sandy. (Samples forwarded.) Bailey believes the stone will go throughout, and some of it is so good that by picking it he can obtain enough gold to carry him on by hand crushing. He is compelled to this course as the stamping battery, though only 50 yards distant from the reef is now kept idle. The alluvial working is all carried on by sluicing, the men being scattered along the creeks at various points from the junction of the two branches down to about a mile below the township, a distance in all of some 9 miles.

There are 127 miners employed on the ground, and being engaged in quartz-mining. Of the whole number sixty-one are Chinese. The yield of gold may be pretty fairly estimated from the amounts purchased at Moruya, though probably some small portion of this may have come from Mogo and from the Dromedary.

Bumbo lies on the opposite or north-western face of the heavy range from which the Gulf Creek takes its rise. The reef there has been worked spasmodically up to within a fortnight before I visited the spot, a few days back, when I found it deserted, the engine, battery, plant, &c., being left to take care of themselves. The adit by which the reef is worked was so wet from recent rains that I was unable to enter to get specimens, but I picked up a few stones which the men had been recently trying, which I assume to be the last brought out of the drive, and the poverty of which probably led to the general clearing out of the shareholders. These I forward you.

The Dromedary Creek is a fine stream of water, taking its rise in the Dromedary Mountain, and running into Wogongo. It has turned out a fair amount of gold, and at one time gave employment to over 150 miners. It is now worked out for all but sluicers, and not more than a dozen men at the outside find employment on it.

Not having been called upon to visit Delegate since my last report to the Honorable the Minister was sent in, I have nothing to add to the remarks then made. I may say, however, that, unless other provision be made, I shall visit that distant portion of my district some time within the next two months.

The samples I forward you are only few in number, for having after collection to be carried a considerable distance on horseback, I could not transport as many as I would have wished. Mr. John Shottin, bailiff to the Nerrigundah Warden's Court, has, however, promised to make more complete collections, which he will forward direct to the department. I have at the same time to call your favorable notice to the very great assistance that he has rendered me.

I have now only to allude to the Molonglo and the Warri rushes, if they may be so called, which have taken place during the current year, but I have so recently and so fully reported upon each that I need do no more at present than regret their want of success.

With regard to the yield of gold in the district, the escort has taken down from Braidwood from the 1st November, 1874, to the 31st October, 1875, 13,693 ozs. 2 dwts. 12 grs., whilst the returns furnished me by the Banks show that they have purchased in the same time 10,938 ozs. 16 dwts. 6 grs. This return, however, does not include the amount of gold purchased by the Araluen branch of the Bank of New South Wales, as the Manager of that branch has declined to furnish me with information.

The amount purchased by the Bank at Moruya during the above period is 567 ozs. 11 dwts. 17 grs., being mainly from Nerrigundah, but the Mining Registrar at the latter place estimates the yield of gold thence for the year at 1,644 ozs. 9 dwts.

TUMUT AND ADELONG MINING DISTRICT.

(*Mr. Warden Vyner, P.M., Tumut.*)

GOLD-MINING in the Tumut Division is at a very low ebb at present, and there are no indications of an immediate improvement. Quartz-mining is almost, if not quite, abandoned, and the alluvial claims are small and barely paying wages.

PEEL AND URALLA AND CLARENCE AND NEW ENGLAND DISTRICTS.

(*Mr. Warden Buchanan, P.M., Armidale.*)

Glen Morrison.—This field, which some years ago promised very favourably has become now practically deserted, as there are but two parties at work. During the past year crushings from the various reefs have taken place with highly satisfactory results, especially from the claims known as Kitcher, Stretton, and party's prospecting claim, on the Golden Star reef, and Maloney and party's prospecting claim, on the Golden Bar, both of which claims have yielded enormous returns for the quantity of stone crushed. The quartz throughout the whole of this field is neither difficult to raise or operate upon, and it is a matter of surprise to me

that a large population has not settled here long ago. I regret, however, to say that the miners on this field, as a rule, are sadly deficient in that indomitable pluck and perseverance with which the *bond fide* miner is usually credited, the mode of working the reefs apparently being to stick to the claims for a month or two until a quantity of stone is brought to the crushing machinery (giving in all cases a good and in exceptional ones an enormous result—the last crushing of 16 tons gave 208 ozs. of gold), the proceeds of which are devoted to what may be termed a saturnalia, which lasts so long as the funds hold out. Such a mode of proceeding of course neither benefits the owners of the claims or the reputation of the field itself, and gives little hope for the future development of the reefs, unless under very different management. A few steady practical men would, I am satisfied, do well here. I cannot, however, make this assertion without referring to the present system of leasing, which, even presuming that an eligible class of men might be induced to work this field, must operate seriously against them. The most desirable ground is principally taken up under lease, but not worked in any way; and although I am quite alive to the desirability of recognizing the rights of capital, as a matter of fact these leaseholds are not taken up by capitalists, but by, in many cases, needy speculators, who have neither the means nor the energy to work them. I think the dearth of population is mainly attributable to this cause, and there is a disinclination on the part of practical miners to reside here, so long as they are at the mercy of persons who only hold on to the ground for the purpose of speculation.

Cameron's Creek and Puddledock.—These fields are virtually deserted, the same cause being attributable as in the case of Glen Morrison.

Rocky River.—This once busy district has now almost ceased to exist as a "diggings," in the ordinary sense of the term. After wet weather, employment is found for about 100 men, exclusive of Chinese; of the latter there are not now many in the place. The miners periodically avail themselves of an extra supply of water for sluicing purposes, so long as it lasts, and usually with remunerative results; but directly it fails the greater portion, who have gardens or small farms in the neighbourhood, resort to their cultivation, or otherwise employ themselves in working on the adjacent stations. I do not anticipate any advance in gold mining interests in this district during the current year, but would observe that the township of Uralla, which may be considered the centre of the field, is rapidly gaining importance.

Oban.—This locality, which during the tin fever was worked for both gold and tin, is now pretty well abandoned, and it is unlikely that it will ever recover itself in any way.

Bingera.—In the early part of 1875 some very large finds took place on this field, and the quartz exhibited was of the richest description. It was believed at the time that the reefs would prove the richest in the Colony, and great excitement ensued on the discovery. Deep sinking however speedily exploded any idea that the field would prove more than barely remunerative, as the rich find turned out to be little else but a "pocket," to the dismay of the owners of the reefs who had paid exorbitant sums for their shares. The depressing effect produced by this discovery has never been counteracted since, the population is still sparse, and with present appliances I see nothing to lead me to anticipate any reaction for some considerable period.

Lunatic.—As far as can be gathered from the returns to hand, about 2,190 ozs. of gold has been the yield for the past year, and the miners seem to speak somewhat hopefully of their future prospects. The rush to the Palmer River at the time pretty well cleared out the mining population from this and the adjacent districts, and though numbers of the miners have returned, they do not seem disposed to turn their attention at present to anything but sluicing, which yields a quicker return. The late severe drought has however militated very seriously against much being effected even in this direction.

Nundle.—Most of the reefs here have been unworked for the last twelve months, and many that have been prospected have been subsequently abandoned as unpayable; what work is at present going on is chiefly confined to the alluvial claims, and the Chinese are the principal workers in them. It is difficult to arrive at any satisfactory estimate of the yield of gold from here for the last twelve months, but probably about 1,700 or 1,800 ounces would prove rather over than under the mark.

Solferino.—There are only three quartz-claims at present worked here. The extraordinary furor occasioned by the mining mania some two years ago having met with a reaction

of a very striking character so far as this particular field is concerned. Still the claims actually at work are proving satisfactory to the owners. The depth of sinking varies from 300 to 350 feet, but as most of it is through a mixture of granite and diorite it proves very expensive. However, that the miners have faith in the reefs is exemplified by the fact that a number who left for the Palmer about two years ago have returned. The Mining Registrar informs me officially "that he has received a number of letters from parties who formerly resided on this field, soliciting information as to whether any leases of undeveloped ground had been cancelled." As these applicants had previously a good knowledge of the locality, the fact has perhaps more than ordinary significance. A few men are working the creek here, and are said to be making fair wages. An antimony mine has been discovered about 10 miles away, which is favourably spoken of.

Little River.—There has been but little work done on this field during the past year, though the prospects would seem to be good, as 1,000 tons of stone has been raised from the Perseverance Reef. Of these 600 tons from the surface to a depth of 70 feet, averaged 2 ozs. to the ton, and from that depth to 160 feet, 15 dwts. The Mining Registrar reports that "every claim that stands a good show is locked up under lease," and under the circumstances there is little animation. Until numbers of these leases are cancelled he anticipates no improvement, and I am disposed to fully endorse his opinion.

To a very great extent this report of the gold mining industry may be considered of an exceedingly unsatisfactory nature as compared with similar reports of some years back; but in referring to the existing depression, I think that the causes which have led to it may be traced to the actual indifference in the matter of developing the reefs. The winding up of numerous estates in the Insolvent Court during the past year has revealed the fact that many of those who sought relief in that Court have been more or less embarrassed by the repeated claims made upon them under mining partnerships. The result has been that, locally speaking, any system of co-operation between the working miners on the one hand, and the capitalists on the other, has been seriously checked, and I fear that for some time the baneful effects of rash speculation will continue to be seriously felt in this district. Whether the reefs have been thoroughly tested or not, is a matter upon which I do not feel myself in a position to give a decided opinion; but very little deep sinking, comparatively speaking, has as yet been accomplished. At best the workings have been confined mainly to running out leaders, and when they failed the claims have been abandoned. It can hardly be said that the majority of the reefs have had a fair trial, and under the circumstances it would be unfair to hazard the conjecture that the gold-mining industry in this part of the Colony is by any means irretrievably ruined, or its resources exhausted.

TIN.

However depressing the character of my report of the Northern Gold Fields may be, it is amply compensated for by the very favourable prospects presenting themselves to my notice on the tin fields. What some years ago was an erratic kind of industry, so far as regarded the settled character of the miners and owing to ignorance of practical working, carried on in an extravagant manner, has now become not only a most important branch of enterprise but one developed under both methodical and scientific principles. As the best test probably of the paying character of tin mining, attention may be directed to the uniform scale of wages paid on the fields to competent men, in the face of the fluctuating market for the ore; and also to the substantial character of the buildings and machinery erected on the various claims. As a rule the co-operative system so far as it relates to working the fields by companies has been abandoned, and most of the best paying claims are in the hands of private individuals, who not only work their own leases but purchase largely from either tributers, or smaller parties working in their neighbourhood. So little, I believe, is generally known by the public of the extensive character of the tin mines and their mode of working, that I have been at considerable trouble in collecting reliable statistics, and therefore must extend this report beyond the usual limits, for the purpose of giving the tin mining industry a more than ordinary prominence.

Foremost amongst the tin fields in my district probably stands Vegetable Creek. On this field twenty claims are now being actively worked; though during the year several claims partially or wholly suspended operation, owing either to the low price of ore, the lack of carriage, or of water supply. The question indeed of carriage has proved a very serious one for the consideration of the proprietors of the claims on this field. The road from Vegetable Creek to Grafton was so bad at one period of the year that teamsters refused to face it; and had it not been for the enterprise of a firm in Brisbane, who undertook the chartering of teams to remove the ore to Warwick, it is possible that many would have suspended operations for a much longer time than they did, as they had too much ore on hand, and hence were temporarily crippled financially. The difficulty was however surmounted, and the result has been that the amount of ore dispatched from Vegetable Creek during the year has been 3,042 tons as against some 2,060 tons in 1874. If this increased yield could be accounted for by exceptionally favourable circumstances there might be but little cause for comment; but as a matter of fact circumstances have been rather adverse than otherwise. The tin market in the Home Country has been for a considerable period in 1875 decidedly depressed, carriage has been almost unattainable, and the water supply very uncertain. Apart from this, ground sluicing is almost impossible on the field, the only approach to it being observable on the claim of Hall Bros., who have very ingeniously constructed a long flood race, paved at the bottom with large stones. This race is covered over for a considerable distance with small saplings, on the top of which the wash dirt which does not require much puddling is piled up to the height of 6 or 8 feet. When a thunderstorm occurs and a large head of water is available the latter is turned into the race and the saplings are removed, the dirt then falls into the race, and three or four men supplied with sluicing forks and shovels are able to keep the race clear, and all the benefit of ground sluicing is gained. The ingenuity of this device and its economy perhaps merit special mention.

There can be no question but that the stanniferous deposits in this locality are enormous, and the great drawback to their development lies in the lack of water supply. An excellent suggestion has been made by a practical miner to the effect that permanent water might be brought on to the field from the Severn River, or other regular source of water supply in the vicinity. To effect this an outlay would be required probably beyond the means of private individuals, nor could the latter be induced to hazard such an expensive venture unless secured in the tenure of a very large tract of country, which owing to the amount of land already taken up, either under the mineral lease or conditional purchase, seems unlikely.

The outlay of a portion of the public revenue to supply gold fields with a permanent water supply is not a novel experiment. In Victoria the system has been adopted, and, as far as I can learn, the outlay has been repaid to the Government from the rents charged to the mining population for the use of the water. I think it but right to bring this matter under the notice of the Minister for Mines.

As exhibiting more fully the impetus given to the tin mining industry in the locality above mentioned, the following statistics, referring to the claim of Moore and Co., may be of interest, it being premised that this is *not* the *largest* claim on the creek, but that the figures furnished come from a thoroughly reliable source. This claim commenced active operations in 1873, and from that date to 1874 no less than 176 tons of ore were raised. In the period between 1874 and 1875 the amount was increased to 400 tons, and the returns from 1875 to 1876 inclusive now give a yield of 460 tons. During the three years this land has been worked the outlay for plant and labour has been £21,000, or about £600 per month. The cost of raising the ore and preparing it for market is averaged at £20 per ton, and of the total amount raised 630 tons have been smelted in Newcastle and shipped direct to London, the balance being exported or sold in Sydney as raw ore. At present 60 men are employed by the firm, and eight or nine horses and drays. The wages of ordinary miners average 7s. 6d., and of skilled men 8s. 4d., per day.

From these figures some idea may be gathered of the increasing importance of the tin mining industry, but other claims are nearly equal to this in point of yield, while one—the Vegetable Creek Company—returns upwards of a third more of ore actually raised—viz., 741 tons.

I am indebted to Mr. Gower, Mining Registrar at Vegetable Creek, for a very elaborate and interesting report, which enters more fully into detail than I can very well do in the limits of this paper; the lucid and business-like remarks made by him warrant me in stating that the importance of the tin mining industry has been somewhat underrated, and that the collapse which befel many of the Companies started some years ago is more traceable to want of knowledge of the proper mode of working than to the character of the land which they undertook to work.

From the Tingha fields, with which I may include Cope's Creek, the returns are equally satisfactory. From this district no less than 1,574 tons of ore have been raised during the last twelve months, and that under circumstances of difficulty very similar to those referred to in the case of Vegetable Creek. The back blocks have been comparatively deserted, owing to the lack of water, and the banks and bed of the creek are chiefly to be credited with the satisfactory yield above mentioned. That the back blocks are equally as rich as the other portions has been conclusively proved, and it is now evident that, comparatively speaking, the tin deposits in this district are almost inexhaustible. If carriage has been a matter of difficulty with regard to the Vegetable, it has been still more so in the case of Tingha and Cope's Creek. Several hundred tons were at one time lying in the hands of the claimholders, for which no carriage could be obtained, and then it became a serious matter whether the tributers could be kept on in many claims, as the advances became exceedingly heavy. Although, during the summer, stocks have been cleared off somewhat, there is still a very large quantity on hand, and it is difficult to foresee how the outlet is to be kept on terms with the supply under the present mode of transit.

The shafts sunk on this field are hardly so deep as those on the Vegetable, and in most claims resort is had to tunnelling in the banks of the creek, or the sides of hills. In the former case heavy and expensive pumping gear are required, and in the vicinity of Tingha no less than six powerful engines are employed pumping only. In the case of drives in the hill sides, the dirt is conveyed to the creek for the purpose of washing, but the scarcity of water has severely militated against the development of the dry workings.

During the past year a new township named Wrighton has been formed about 2 miles from Tingha, and situated on the main Cope's Creek. The bed of the creek here has been found to be exceedingly rich, and as the claimholders are all working, more or less, under the tribute system, a considerable population has gathered about the new township which bids fair to prove of a permanent character.

Taking then the whole position of the Northern Tin Fields in rapid review I am disposed to speak more than ordinarily hopefully of their future prospects. Railway extension, bringing these mining districts in connection with the collieries, will assuredly lead to far more land being worked than hitherto, as the cost of conveying the ore to Newcastle, or smelting on the spot, will be very much less than at present. Improvements in the mode of treating the deposits are being daily made, and no doubt, ere long, the expenses will be considerably reduced. Too much stress cannot however be laid upon the fact that (as much speculation is going on amongst leaseholders on the tin-fields as on the gold-fields, and thousands of acres are practically locked up under the present leasing system), the cancellation of numbers of these leases should be a matter of early consideration, especially as the reaction is setting in from the Palmer gold-fields, and very many miners are returning to the district. Many of these men have saved money, and being practically acquainted with alluvial working would be only too willing to invest their cash in working tin claims if such were only procurable.

Considering then the untoward circumstances under which the tin-mining industry has been carried on for the last twelve months, and its favorable results, I cannot do less than augur an equally satisfactory state of things continuing during the current year.

PEEL AND URALLA DISTRICTS.

(*Mr. Warden Irving, P.M., Tamworth.*)

There are no minerals mined for in the district under my charge other than gold. There are indications of copper on the Peel River Land and Mineral Company's Estate near Nundle, but no lode has been opened up. Antimony is found close to Nundle, both on the

Crown Lands and on the Peel River Company's Estate, but I believe the ore is considered not to possess a sufficient commercial value to leave a margin over expenses of raising and transit to market. The working of this ore is not therefore prosecuted; a mineral lease was applied for on this antimony lode near Nundle, but there has been no work done there for a considerable time.

Mining is therefore solely for gold in my district, which includes the Peel River Gold Field, between thirty (30) and forty (40) miles from Tamworth in a south-easterly direction, and the Iron-bark Creek and Tea Tea Creek Gold Fields near Barraba, and distant from Tamworth between fifty (50) and sixty (60) miles in a nearly northerly direction.

The Peel River Gold Fields, which include Bowling-alley Point, Nundle, Hanging Rock, and Mount Misery gold workings, were, at the time of their discovery, and for a few years after, for their limited area, very productive as an alluvial gold field, and a considerable population of European and Chinese was maintained there up to 1865-66. Since then the population has gradually melted away by migration to other gold fields, and although there was a revival in 1871-72, from the mining excitement of that period extending itself to this gold field, and many fresh undertakings were set afloat, I consider the collapse of these schemes which ensued rendered the aspect of mining affairs on these gold fields more wretched than it was before. There was a temporary rise in wages, and money was readily obtained by sale of claims to speculators, and after this temporary prosperity departed many of the miners left the place—either for other gold fields, or, in some cases, for the purpose of acquiring lands by selection.

Quartz veins and Alluvial workings.

The last observations apply to the temporary desire in 1871-72 to take up new quartz claims; of the numerous leases applied for only the following are being worked.

The We'll Prosper, at Hanging Rock.

The Moonlight, between Bowling Alley Point and Nundle. Two steam-driven stamping batteries, with all modern appliances, were erected at Bowling-alley Point. Both of these are at present (and have been for some time) standing idle. The old water-wheel crushing plant of J. P. Robertson is the only one now worked at Bowling Alley Point, the stone crushed therein being chiefly from the Marquis of Lorne Reef (which is in the Peel River Company's land). The stone lately raised from this reef has gone, I believe, 5 ozs. to the ton. The stone is brought to grass by means of a tunnel which is driven into the face of a hill for a long way, and the reef is being worked at a depth of 300 feet from the out-cropping of the reef on the hill where the first shaft was sunk. This reef is the most promising of any that have been worked at Bowling Alley Point for some years back. Doubtless the same reef extends to the Crown Lands on the east of the Peel River, but none identifiable by similar richness has been opened out on the Government side.

The We'll Prosper Company's Mine at the Hanging Rock, formerly the Foley's Folly Mine." A great deal of work has been done at this mine, and numerous shafts have been sunk. There is a very long tunnel which reaches the bottom of these older shafts, and from the floor of this tunnel a shaft of 100 feet in depth gives access to the stone now being raised, the whole depth being 430 feet. The managers of this mine claim for their mode of working the advantage of great economy, the stone being raised on the compensation principle by water power.

There is a Newcastle Company (The Oposum Company) which holds claims on various quartz-veins at Bowling Alley Point, and owns one of the fine steam-crushing plants I have spoken of as being idle at that place; this company seems to be lying on its oars at present.

Between Bowling Alley Point and Nundle on the Peel River a reef is being worked by a company called the Moonlight Company. The holders of this reef are sanguine as to its paying prospects, but I am not possessed of any reliable information about the rate per ton of the quartz raised. The crushing plant here is worked by water power; the depth of the mine is about 100 feet I believe.

At a place called Mount Misery equi-distant from Hanging Rock and Nundle there is a remarkable vein of cement of considerable thickness at a distance at a depth of 100 feet. This cement when worked by Woodley & Co. was remunerative. The quantity of gold per

ton was moderate, but the bed of cement being of great thickness, the ease with which the washing stuff was obtained rendered the working a success. Woodley & Co. treated this cement by exposing it for a time to the atmosphere until it crumbled, and then washing in the usual way. Some three years back Woodley & Co. sold out to a company who erected steam machinery to crush the cement. After a time this company's operations were reduced to working the cement by tribute. Latterly they have not been working at all, pending, I understand, negotiations on foot in England to float a company for the purchase of the mine. Quite lately the proprietors have applied for an additional lease of 25 acres. It has always seemed to me that this cement will at some time be very remunerative.

Some leases were applied for in 1871-72 in the neighbourhood of Woodley & Co.'s original claim; but I do not think any are being worked now, except Bond & Co., who have lately made application for leases of 2 acres and 4 acres of this cement vein. Bond & Co. have had possession of this ground for some considerable time, and have driven an adit level nearly 400 feet, through rock, to get to the supposed cement lead.

The total number of miners on the Peel River Gold Fields is as follows:—

Europeans	...	...	...	...	...	...	95
Chinese	...	...	...	...	...	...	70

The Ironbark and Tea Tea Creeks Gold Fields.

There are very few persons mining for alluvial gold on this gold field at present. On Tea Tea Creek—the workings in which seem only to cover a small patch of ground—the miners have never exceeded twenty-five and are now much fewer. I forwarded a sample of gold (Mr. Pryke's nugget) from this alluvial washing in the shape of a nugget of 1 oz. 16 dwts. to the Secretary for Mines, who was pleased to express his pleasure in having the same submitted to his inspection. Water is only obtained on this creek by the collecting of rain after a shower. One miner wished to make a large dam and erect a puddling machine to puddle for the public, but the others all objected to it, which is to be regretted, as the working of the place can never advance with only the hand to mouth supply of water which every man making a tiny dam for himself affords.

Quartz Reefs now being worked on the Tea Tea and Ironbark Gold Field.

1st. Reading's Reef in the Tea Tea side of the gold field; depth where stone is being obtained, 115 feet; width of vein, 3 feet; stone lately raised supposed to go 15 dwts. to the ton.

2nd. Black Mountain Reef (same side), Aberdeen Tribute Company; depth where stone is being raised, 100 feet; width of vein, 18 inches; stone lately raised supposed to go 1½ oz. to the ton.

3rd. Easter Gift Reef, Crow Mountains, Ironbark side of gold field; depth where stone is being raised, 50 feet; width of vein, 12 inches; yield of stone not known—supposed 4 ozs. to the ton. 1 ton of picked specimens from the reef crushed by hand yielded 100 ozs. per ton.

In conclusion, I am sure if some of the miners who have acquired a greater experience on other gold fields were to turn their attention to the Peel River and Tea Tea and Ironbark Gold Fields, these might yet come to the front with profitable results. As it is, the flower of the mining population have migrated and do not return.

It is very difficult to ascertain the amount of gold purchased—to reckon up the purchases made by dealers in the fields; and then the amount purchased by the Banks in Tamworth is nearly stating the same amount twice over. By far the major portion of the gold which is procured in Tamworth District goes by escort, and the most reliable return is that of the Gold Receiver here.

Since writing this I heard of 300 ounces having been sent privately to Mint. The Government Escort only taking place every second month of late; this change induces holders of gold to take more frequent means of transmission.

I append a return of the gold purchased for nine (9) months, since January, 1875, so far as I can collect the information.

RETURN of sales of gold in the district under Mr. Warden Irving's charge during the first nine months of 1875 :—

The gold which has passed through the Banks in Tamworth during the first nine months of 1875 has been about one thousand and three (1,003) ozs.

The only transactions in gold buying by private buyers I have been able to learn particulars of are at the Ironbark and Tea Tea Creek Gold Fields, and are as follows :—

At Barraba.....	182 ozs.
At Tea Tea.....	10 „
At do.	65 „

Notwithstanding these meagre returns, I consider that (as has been nearly always the case) a goodly proportion of the gold sent to Mint is the produce of the Nundle and Barraba Fields.

NEW ENGLAND AND CLARENCE DISTRICT.

(*Mr. Warden Graham, P.M., Tenterfield.*)

The principal mines in the district are the tin mines, and I will deal first with them.

The Maryland tin mines are situated on the eastern slope of the Main Range, about 35 miles north from Tenterfield; they are at an altitude of about 3,000 feet above the level of the sea. The country is of granite formation, intersected by numerous watercourses; the whole extent of the country from Maryland to Bookookoorara, about 15 miles, with a width of about 7 or 8 miles, is more or less tin-bearing, and in almost all the creeks or watercourses included in that area large deposits of stream tin ore have been found.

The great supply of tin ore appears to have come from that portion of the Main Range which forms the watershed of the Two-mile, Wilson's Downfall, Cemetery, Herding-yard, and Ruby Creeks, as in these creeks the richest deposits of tin ore have been found. On the corresponding side of the Range (in Queensland) the celebrated Sugar-loaf, Quart-pot, and Lode Creeks head. The great richness of these stream deposits induces the belief that immense mineral wealth is hidden in that portion of the mountain. As yet there has been little or no prospecting for the discovery of lodes or reefs, but I have little doubt that as soon as the stream tin is worked out the miners will turn their attention to the searching for the lodes which have originally fed the alluvial deposits that are now being worked, and such search might be fairly encouraged by a reward being offered by the Government for the discovery and opening of a payable tin lode.

Since the first commencement of mining on Maryland (about the middle of 1872) large quantities of tin ore have been obtained, and a population averaging over 1,500 souls entirely supported by that industry.

The land was originally taken up under mineral lease under the "Crown Lands Occupation Act of 1861," and, with few exceptions, the payable portions of it are yet so held.

The mines are now principally worked on tribute and royalty; one claim alone of any importance is at present under wages. The royalty ranges from £6 to £15 per ton, and tribute from £25 to £30 per ton.

I estimate the number of miners now actually employed in mining to be about 500, and the present yield of tin ore to average 30 tons per week, the value of which on the ground would be, say, at £40 per ton, £1,200. The expenses of carriage from these mines are comparatively small as they are within 40 miles from the Warwick Railway.

The most important mines now working are on Herding-yard, Cemetery, Wilson's Downfall, Wylie, and Ruby Creeks; the depth of stripping averages about 8 feet, and is seldom more than 12 feet, with about 18 inches of wash. The width of the run varies very much; the widest face is in Messrs. Amos, Brothers, claim, on the Herding-yard Creek, where it at present shows a width of over 100 yards. This claim averages a weekly yield of nearly 10 tons with about seventy wages men employed.

There appears to be every probability of the stream tin workings on these mines lasting for some years, as yet there is no appearance of working out, and discovery of old beds of wash and old deposits not indicated in the surface are of common occurrence.

The tin ore obtained from these mines yields a very high percentage of metal. The average assay cannot be less than 72%. The ore obtained from the heads of the creeks is very coarse, and little waterworn in many cases, showing perfect crystals. Lower down the creeks the ore gets gradually finer until it gets so fine that it cannot be saved by the ordinary process of box washing.

After many experiments as to the best and cheapest mode of separating the ore from the dirt the common sluice box with the sluicing fork or shovel is now generally adopted. From the formation of the country ground sluicing is not practicable, as sufficient fall cannot be obtained. The supply of water is sufficient for box sluicing, and permanent.

The tin mines next of importance in the district are the Mole Tableland Mines, situated about 35 miles south-west from Tenterfield in the northern fall of the spur range dividing the waters of the Mole and Severn Rivers. The country is of granite formation, and in many places rough and almost inaccessible. The extent of country tin bearing is very great; I should estimate not less than 100 square miles.

Mining for stream tin ore has been successfully carried on in the numerous creeks intersecting the country since 1872 until lately, and large quantities of ore has been raised. As most of the richest deposits have now been worked out, the expense of getting the ore to Sydney, and the difficulty of obtaining carriage, has rendered the mines, at the present price of tin, unpayable; little or no work is now being done.

Tin reefs or lodes have been discovered on these mines, and many of them, from their richness, promise, as soon as capital can be obtained to work them, to turn out to be of great value. The Planet Tin Mining Company have expended a considerable sum in developing the lodes running through the land held by them. Operations by this company are at present suspended, awaiting arrangements for further carrying on the works.

GOLD.

In commencing my report on the gold mines in my district, I must state that from the remote position and distance from my head quarters that many of them are situated, I have found it as yet impossible to visit them, or obtain the necessary information to enable me to make a full report. I have also found it impossible to obtain reliable information as to the quantity of gold bought and sold in the district; the Banks here are not buyers.

Boonoo Boonoo Gold Fields—situated about 15 miles north of Tenterfield, were once payable alluvial fields, but are now almost deserted; the alluvial, with one small exception, has been worked out or abandoned. There are three or four very promising reefs; on one, about 30 tons of stone have been raised, showing good gold, and I am informed that a trial crushing was made of some of the stone, and that the yield was 5 ozs. to the ton. Work is at a stand still in consequence of there being no crushing-machine. The country is very rough, of granite formation, and the reefs are from 18 inches to 2 feet wide. I believe that arrangements are now being made for the erection of a crushing plant.

Lunatic and Perseverance Mines are situated forty (40) miles east of Tenterfield. These mines were for some time almost deserted, but are again coming into repute; good payable stone is now being raised on the various claims working; at present there is only one small battery of three head of stampers on the ground belonging to "Gray's Gold Mining Company." The company have a 3-acre lease on the Lunatic Reef, and have two shafts down one 130 feet, and one 50 feet. The 50 feet one is now working. The reef is from 16 to 20 inches wide, with hard sinking; it runs north and south with a westerly dip—underlay about 1 in 6. About three months ago 30 tons of stone obtained from the new shaft was crushed, and yielded the handsome return of 8½ ozs. to the ton; about 35 tons are now going through the machine.

Bedwell, Smith, & Co., 2-acre lease, on the Perseverance Reef—one shaft of 110 feet and another of 130 feet; they are at present driving. Work on this claim was suspended for some time, and has only just now again commenced. The reef is from 1 foot to 18 inches wide, running north and south with a west dip.

No. 1 South Golden Crown Reef is about 180 yards from the Perseverance Reef, held by Horton and others, 3-acre lease. The reef is very narrow, running from 2 to 6

inches wide ; there are four shafts sunk in this lease at the respective depths of 20 feet, 40 feet, 100 feet, and 110 feet. About 15 tons of stone at grass ; last crushing yielded 8 ozs. to the ton, but lately 2 cwt. of stone crushed by hand (pestle and mortar) yielded 15 ozs. of gold.

No. 2 Golden Crown—two men's ground, extended claim, owned by Armstrong and Flood. There are three shafts sunk on the reef, one 140 feet, one 70, and one just started, about 15 tons of stone at grass ; the reef is from 6 to 8 inches wide, and the stone yields about 5 ozs. to the ton.

Caledonian Reef—Andoff & Co., 6-acre lease, situated about 200 yards east of Perseverance Reef. The reef runs north and south with a westerly dip ; a drive is being put in from the creek into the hill, and is now on the reef about 60 or 80 feet ; the level of the drive is about 300 feet below the top of the hill ; about 40 tons of stone to grass, which is estimated (after trial) to go 2 ozs. to the ton ; the reef is from 18 inches to 2 feet wide, and the stone easily obtained.

Timbarra Gold Fields—situated about 25 miles south-west of Tenterfield—are now almost completely worked out ; the workings are all alluvial.

On M'Leod's Creek there are six men working a claim and making good wages. On the old Table Land Diggings about 30 or 40 men are working—principally Chinamen.

On Poverty Point water is being brought on by a well constructed race, which will be when finished about 6 miles long ; good results are anticipated as soon as work can be commenced.

Dalmorton—situated about 100 miles south of Tenterfield—I have not yet been able to visit or get any information about.

Cangai and Tooloom are also over 50 miles from here, and I have been unable to visit them as yet.

MINING REGISTRAR'S REPORTS.

BATHURST DIVISION.

(*Edward Farr, Mining Registrar.*)

MINING operations in this Division are carried on at,—

Cheshire's Creek,
Clear Creek and Winburndale,
Caloola,

Glanmire,
King's Plains, and
Cow Flat,

But by reason of the unproductive nature of the results, every branch of this industry is in a very depressed condition.

Quartz Mining.

Glanmire.—No new discoveries have been made of recent date ; all the reefs have been abandoned, excepting one on Mount Ovens ; at this reef (which is from 3 to 6 inches wide) two miners are at work, and the stone raised by them yields 7 dwts. to the ton.

Roper's reef has been abandoned, as the vein could not be traced below the level of 30 feet, above that the average yield was 9 ozs. per ton ; the gold being of an inferior quality, and worth only £2 10s. per oz. A crushing battery is stationed here, but the lessees are merely operating on the tailings which have accumulated in more prosperous times.

King's Plains.—No defined reefs have been discovered in this locality ; some prospecting has been done, but with little or no success.

Cheshire's Creek.—Only a few miners are located here, and the yield of gold is very small.

Clear Creek and Winburndale.—The quartz reefs in this locality yield no remunerative returns, and the miners who were so sanguine of success two or three years since have removed elsewhere.

The quartz veins in this locality are very narrow and numerous; most of them contain gold, silver, lead, iron, and an occasional trace of copper, and also sulphur in large quantities.

The Francis line of reef yield of gold was one to six ozs. per ton, but very difficult to save in the crushing process; the vein narrow, and stone hard to procure.

Blackman's line, yield of gold, 3 dwts. to 1 oz. per ton; stone hard to raise, and water very troublesome.

D. Donnelly's, Oakley line.—Assay, 9 ozs. gold, 11 ozs. silver; lead not given. Two tons are about to be sent to Swansea for trial; vein very narrow.

Russian Gully.—Rich specimens were discovered on the surface, and for 2 or 3 feet down, then the vein goes off into ribbons.

M'Kinnon's reef is about 1 foot wide, and yields 15 dwts. to the ton. Casing is not very hard; but the difficulty experienced in conveying the stone to the battery is an obstacle to the development of the mine.

At the bank of the creek there is a powerful crushing battery, owned by Mr. Denis Donnelly.

Caloola.—A large amount of capital and labour was expended here some three years since, in consequence of the discovery of a payable leader in the prospecting shaft, but no satisfactory results followed. The lode which was opened up with excellent prospects near the quartz prospecting claim also disappointed the expectations of the proprietors, and at the present time Caloola is very little thought of.

Alluvial Mining.

Glanmire.—At the present time only a few miners are at work and making a living; during the most prosperous times these diggings only afforded wages.

King's Plains.—The yield of gold in former years was very large, but it was chiefly obtained from private property. No new discoveries have been made for a considerable time, and at the present moment not more than thirty or forty miners are at work within an extent of 5 miles.

Cheshire's Creek.—No alluvial diggings of any consequence have been worked here.

Clear Creek and Winburndale.—This field having been worked for eighteen years is considered worked out except for sluicing. The Winburndale Sluicing Company have recently completed their race, which extends for a distance of 27 miles, and are arranging to let it and their claim on tribute, and Mr. Denis Donnelly, who occupies a large area of abandoned ground, has purchased another water-right; under these circumstances, probably a more encouraging report may be furnished at the termination of next quarter, but at the present time this locality shares in the general depression.

Caloola.—A very rich surface patch of heavy gold was struck some years since at Caloola, but like all known deposits in this district it was soon worked out; at present the miners in this locality confine their attention to shallow sinking.

Copper Mining.

The Cow Flat Company's Mine, which is the most important in the district, employs about eighty miners, and the yield of copper has not decreased during the past twelve months compared with the number of men employed. In connection with this mine there are six furnaces, but only two used, owing to the sheds being leased to the Esk Company, this latter Company reduce the ore to regulus, and send it in that state to their works at Lithgow Valley, for further treatment.

The next in importance is the Apsley Mine, which has declined lately, twelve miners are working here with remunerative results to themselves as tributors; there is one furnace close to this property used by the Esk Company, but it is not worked continually just now.

The Belmore mine affords employment to two parties of tributors with payable results.

The tributors working on Messrs. Hulks & Co.'s property, 2 miles S.W. of Cow Flat, are raising ore of such quality and in sufficient quantity to recompense them for their labour. Other parties are expected to commence operations at this spot shortly. Part payment has been made on behalf of an English Company for the purchase of a large area of ground in the Cow Flat district, and this branch of industry appears to be in a far healthier condition than gold-mining as far as regards this Division; there are many likely places worth trying, but the great drawback to prospecting, and proving ground where veins of ore exist, is the hardness of the rock, which soon exhausts the amount of capital devoted to mining enterprises in this Colony.

Messrs. Croaker & Co. have erected a furnace about a mile from the Cow Flat Company's mine, but it is rented to the Esk Company, I presume for the purposes for which the other properties are secured by them.

There are upwards of twenty other lodes opened, but are lying idle.

BATHURST DISTRICT.—TRUNKY DIVISION.

(Thomas Waldie, Mining Registrar.)

IN submitting this my first report of this gold field, I have endeavoured to give as much information as possible, in order that the importance of this extensive division may be more fully brought before the notice of the public, and its real resources as a gold field better known. I have in this instance noted more specially the deepest workings, and one of the extensive deposits or alluvial drifts, and one notable lode, the whole report extending over an area of 15 miles from north to south, and 18 miles from east to west, almost every acre of which is auriferous. Upon this field gold-mining or digging has been carried on for over twenty-five years; portions have been worked and abandoned, some from an insufficient supply of water to wash the stuff, and some from too much water to contend with in the workings. Most of the deposits are being worked by means of ground sluices, some of which are supplied from the various creeks and some from the storm-water gathered from the various water-sheds, conducted through races, varying in length from 1 to 3 miles. Almost the whole division is mountainous, of volcanic formation, bounded by the Abercrombie River, and intersected by various creeks. A most remarkable feature in the auriferous deposits is that a great many of them are to be found on the tops and sides of very steep mountains. There are within an area of 10 miles around the township of Trunkay alluvial deposits, which, if water could be brought to bear on them, would support a population of from 15 to 20,000 people for years. Considering the importance of this part of the Western District, I conceive it to be one of the most extensive and varied schools for the student of geology and metallurgy that he could desire, for in it are to be found precious stones of almost every kind. The opal is to be found in almost any part of the Abercrombie Mountains; the deposit in which they are found is claystone porphyry, many samples of which I have sent to England, varying from the pure white to a beautiful amber, and two or three very fine ones of the Harlequin, showing a magnificent play of colour. Cinnabar has also been found in the bed of the Grove Creek. Gold, silver, and copper have also been found.

Having so far reviewed in a general way the character of the district, I will now endeavour to show the importance of it as a quartz-reefing field by statistics and samples of the ores from the various reefs. From some of these I have not been able to get samples owing to the fact that no one is at present working them, but every statement contained in this report can be borne out by the returns of the various crushings, many of which crushings have taken place under my own personal supervision, so that the Department and the public can rely on the accuracy of the statements here made.

Taking as a datum a distance of half a mile east of the township, and continuing in a westerly direction for a distance of $\frac{1}{4}$ of a mile, seven distinct quartz veins are crossed, every one of which have been worked from the surface to a depth of from 100 feet to over 500 feet, and the yields have varied from 6 dwts. to 20 ozs. per cubic yard, and the veins vary in thickness from 1 inch to 15 feet, the general thickness being about 9 inches, the large yields being

from the smaller veins, the adjoining formation to the vein is slate, some of which is very hard, especially when it is in a metamorphic state, but the general character of the ground from the surface to water line is of fair average working kind, and costs about £1 per foot sinking 6 feet by 3 feet, and driving about 10s. per foot 6 feet by 3 feet, but below the water line a very great change takes place on many of the veins, some costing as high as £7 per foot, some on the other hand continue as soft below as above the water line, notable the "King of the West," in some parts of this mine it was a common thing for one man to drive 10 and 15 feet in a shift of eight hours, and the sinking was equally as easy. Again on what is called Crummie's Line in one mine, No. 7, or the Alma G. M. Co., the vein has been worked to a depth of 300 feet, the ground soft from the surface to the lowest workings, whereas No. 5 on the same line and only 200 yards south has very hard metamorphic slate, and here, even with dynamite and lithofracteur, scarcely as many inches were sunk as there were feet in No. 7 in the same time. I find from practical observation that where the vein or country is intersected by gullies there is sure to be a fault or break in the vein, and then a change in the character of the ground may be calculated almost with certainty. In some of the faults the veins is shifted as far as 3 feet, a block of blank ground being between. If the fault occurs below the water line it invariably affects the drainage, thus it was that some of the mines could work comparatively dry at 120 feet while claims only a few yards distant could hardly keep the water down. Leaving our immediate quartz veins, I will now refer to what I consider one of the most important deposits namely, "Hell's Hole." This mine is situated about 12 miles in a southerly direction from the township of Trunkey on the northern side of one of the large mountains known as the Abercrombie Ranges, the Oakey Creek skirting it on the west side from the creek, the mountain reaches an altitude of 500 feet or thereabouts, there has been a face opened about 250 feet from the foot, the face is opened 60 feet wide and 250 feet high. On the east side the limestone has been reached, but on the west side they are still in the lode. I have forwarded a sample of the lode, also a sample of one of the numerous quartz veins that intersect the lode in every conceivable direction, varying from 1 to 6 inches in thickness, some of the veins being very rich in gold. Some specimens (which are now in England), given to me by Mr. John H. Wilson, one of the proprietors and manager, were about the size of a pigeon's egg, and contained 4 dwts. of gold, some were even richer than these, and I hope when the samples have been properly tested you will be so good as to forward to me a report thereon for the benefit of the public and the enterprising shareholders. If we take this mine as a starting point, and travel about 3 miles in a southerly direction, we come to the place called the Sounding Rock, the drift being worked at this point by ground sluicing is exactly the same as the lode at Hells Hole, a sample of the drift I have sent with some of the stones in the wash as I took them from the claim, the wash where they are working is 25 feet thick, and the yield averages 6 dwts. per ton, there are four miners working, and to use their own words, when I asked how much they washed in the day they replied, we knock down 30 or 40 tons and it is gone in ten minutes, they keep no books, they wash the stuff, get the gold, sell it, and that ends the chapter. This deposit continues for about 300 yards to where the Abercrombie junctions with Oakey Creek; on the opposite bank of the Abercrombie River we there have exactly the same deposit which continues down the course of the river for at least 3 miles, both the banks of the river and the banks of the Oakey Creek have been worked for many years, and proved highly auriferous for miles, the great drawback to its being worked on a large scale is the expense attending getting the water to bear upon it. If water was laid on this part alone would support a large population. The water with which the deposit shown on the diagram is worked, being brought from the Oakey Creek by means of a race $2\frac{1}{2}$ miles long, many difficulties attended the construction of this race, a great portion of it being built on the side of the mountains and took nearly two years to complete. Coming back again to the Hells Hole mine, and then taking a northerly course we continue for a distance of about 2 miles, when we come again to the Oakey Creek, on the banks of which we have the same lode as prospected by Mr. Wilson, here the lode has been opened 10 feet wide and 7 feet high, and a trial crushing gave 9 dwts. per cubic yard. I hope I have been able to convey to the department some idea of the importance of this particular part of the Trunkey division, though I am aware I have not been able to do justice to so important a seat of mining enterprise. I will now proceed to refer to the deepest workings on our quartz veins.

The King of the West.

This mine being the deepest of this division, if not in the western district, has an area of 40 acres, is situated about 2 miles north of the township, and is on a wide flat, surrounded by moderate hills, with a good supply of box, gum, and stringy bark timber, all suitable for fuel for steam purposes, which can be delivered at the mine at the rate of 8s. per cord of 128 feet.

The plant consists of a twenty-five head crushing machine, with steam power to 40 horse, this engine will pump the water from the mine as well as crush. The system of treating the quartz, is to crush (raw), after which it passes through silver wells over copper plates, then on to a concentrating revolving table, designed by J. O. Phillips, Esq., one of the Directors of the Co., after which the concentrated deposit is passed into revolving amalgamating barrels, and ground with small discs, after which the stuff passes into the general outlet. There is also a winding engine of 12-horse power, also a small crushing-machine of 8 heads of stamps, with dams, saw mills, offices, and workmen's houses, the whole having been erected at a cost of £10,000, under the supervision of D. R. Cruchton, Esq., the Company's General Manager, and to whom I have been much indebted for the information kindly given to me. What is called the dip of the reef in the tabulated forms herewith, we call the underlay. The vein dips east, and the strike north and south. The mine has been tested to a depth of 50 feet, over an area of 16 acres, with good results. Owing to an influx of water, operations were suspended for the purpose of reorganizing the Co. When in full work eighty miners were employed, and the quantity of water bailed was at the rate of 100,000 gallons per day of twenty four hours.

The next mine of importance here is the

Trunkey Creek Q.M. Co.

This mine is situated opposite the township, on a range of hills, about 120 feet above the creek, which runs at the foot. This mine covers an area of 73 acres, through which runs five gold bearing veins, one of which is the first that was discovered. The first crushing of 8 cwt of quartz gave 400 ozs. of gold. On the ground held by this Co., there has been a great deal of work done; on the south end of the ground there is a perpendicular shaft sunk to a depth of 240 feet, with a crosscut to the west of 150 feet; there is a good body of quartz from water line to bottom of shaft, which varies in thickness from 4 inches to 2 feet; the adjoining rock is metamorphic slate, and the stone is heavily charged with sulphur and iron pyrites, and when tested in Sydney gave a return of 2 ozs., but in the ordinary process in use only $\frac{1}{4}$ oz. per ton is obtained. I have sent a sample of the quartz, marked "Pioneer." Above the water line the quartz yields 1 oz. per ton. At the north end there are two deep shafts, one 220 feet, is used as a ladder and air shaft. The working shaft is 300 feet in depth; at this depth the vein varies in thickness, from 4 to 8 inches; there are fifty miners employed, with two whims, and five horses. The plant of the Company consists of a crushing machine, of 10 head of stamps, with silver wells, copper plates, and blanket tables. Samples of stone from this mine, both above and below the water-line, have been forwarded. The quantity of water bailed is at the rate of 15,000 gallons per day of 24 hours.

The Alma G.M. Co.

This mine is situated about 1 mile north of the township, and contains an area of 9 acres; the main working shaft is about 300 feet in depth, and the average yield from it has been $1\frac{1}{4}$ oz. per cubic yard; the ground is good working, but the water rather heavy; work has been suspended, but there is every probability that it will be worked on tribute in a short time. There is a crushing-machine of 12 head of stamps, also a horse-whim; the system of treating the quartz is by crushing (raw), with silver-wells, copper-plates, and blankets; when operations are again commenced, I will procure a sample of the quartz.

The Pembroke G.M. Co.

This mine is situated about 6 miles, in an easterly direction, from the township of Trunkey. The reef is about 18 inches in thickness, from the surface down to water-line 120 feet; there have been two shafts sunk, and about 100 cubic yards of quartz crushed, and

the yield has been from 1 oz. to 15 dwts. per yard; the mine is at present idle, the principal cause being the great distance from a crushing-machine, and the heavy price of cartage. The reef is hard, but the adjoining country is a soft brown slate, and good to work.

The Grove Creek Gold Mining Company.

This mine is situated about 10 miles south-east from the township of Trunkey, and contains an area of about 25 acres, there is no defined reef, the quartz being found in large boulders, and in some places on the surface the quartz is 200 feet in width, a sample of which I have sent. It is a limestone country, very mountainous, and the Grove Creek runs at the foot, by the side of which is erected the Company's crushing machine of twenty head of stamps; the system of treatment is by crushing (raw), amalgamating in silver wells, copper plates and blankets, and then passing through revolving barrels, the yield has been from $\frac{1}{2}$ oz. to $\frac{1}{2}$ dwt. per ton. Operations are at present suspended, I cannot state the reason, but I suppose want of capital. I will now give the names of the various lines of reefs, commencing on the east side,—

1. The Star Line, 20 tons crushed, yield 1 oz. per ton.
2. Pioneer Line, worked for about 2 miles.
3. Arthur's Line, worked for about 1 mile, yield from 6 oz. to 1 oz.
4. Eddington's Line, worked for about $\frac{1}{2}$ mile, yield from 1 oz. to 9 dwt.
5. Crummie's Line, worked for about $\frac{1}{2}$ mile, yield from 4 oz. to 6 dwt.
6. Alexandra Line, worked for about $\frac{1}{2}$ mile, yield from 6 oz. to 6 dwt.
7. Wright's Line, worked for about $\frac{1}{2}$ mile, yield from 5 oz. to 3 dwt.
8. Wilson's Line, worked for about $\frac{1}{2}$ mile, yield from 3 oz. to 1 oz.
9. The Pembroke, 6 miles to the east, 1 oz. 15 dwt.

It must not be understood that this Report embraces the whole of the auriferous ground in the Division, because it would take a long time with a great deal of travelling over a very mountainous rough country, and to obtain the information I have been able to give you, I have travelled a great many miles, in some cases 20 miles after office hours, in order that I might be able to give some information. If there is anything I have overlooked I shall be most happy to furnish it, so long as it will be of benefit to the public and the Department, and will tend to the advancement of mining interest.

BATHURST DISTRICT.—TUENA DIVISION.

(S. J. Cotter, Mining Registrar.)

IN this Division, an old gold-field of twenty-three years standing, the enterprise and prosperity of the mining interest has for the time been paralysed by the reaction from the mining mania of 1872-3. The system which then prevailed had a most mischievous effect on the mining community. Ground was taken up more for the purpose of "working a swindle," as it was openly called, than from any *bonâ fide* belief in its value, or intention to work it. The extravagant hopes of dupes who were induced to purchase were destroyed by the first chill of adversity; and in most instances ground taken up for no purpose but to float or sell, and on which money was afterwards spent in a wild and reckless manner, was after all deserted without a fair trial. The real working miners always stood aloof from this mode of dealing, which was chiefly practised by speculators, sharpers, and unsuccessful persons attracted from towns and other callings, to which they reverted when the crash came. For the time however the mining interest was so adulterated by them that the *bonâ fide* working miner was indistinguishable, and has now most unjustly to pay the penalty, in the loss of the support and confidence of persons with capital. They must now, as a rule, depend entirely on their own resources while prospecting, trying to "bottom," to strike the "lead" or the "reef." The unequal and uncertain nature of their earnings necessarily fosters improvidence, many soon reach the limit of their resources, and are obliged to leave off and seek some other means of livelihood. Chiefly owing to this cause, prospecting is discontinued here at present. Quartz mining is in progress on the City of Sydney Company's lease alone, and alluvial mining is confined to reworking the "points" or flats—angles in the tortuous course of Tuena Creek, where rich deposits have been found in the early days of the gold-field. Perhaps the best remedy lies in the restoration of public confidence.

The alluvial ground in my division is situated along the course of Tuena Creek, on both sides, for a distance of fully 20 miles. Its limit rarely recedes more than 200 or 300 yards from the stream. There have been no regular leads or gutters, but a series of isolated patches of payable ground, constituting for the most part the "points" I have mentioned, in many of which rich deposits have been found in a heavy boulder wash, with bottom of soft blue slate, at a depth varying from 3 to 30 feet. The mode of working has been, and is, by open cuttings in the shallow ground, in the deeper by shafts and drives. The pick, shovel, and cradle are the only *modi operandi*. Operations are now confined to ground sluicing by means of water races brought on to the "points" from the main creek and its tributaries. The remuneration obtained is high for the time the men can actually work, but the supply of water is so uncertain that they are often in enforced idleness, and the average rate is very low.

In quartz mining the state of things is still worse. The trail of the swindler and the speculator is over it all. There is but one lease working in the division—the "City of Sydney," at Tuena. At Junction point, where so much ground was taken up and such extravagant hopes formed, not a solitary claim is working. They are all virtually abandoned, and there is no one even in charge, except at the "Washington," the property of Towns & Co. This circumstance made it difficult to get particulars, for which I am largely indebted to Mr. Zouch, in charge at the "Washington." At Junction Point a great deal of *bona fide* work has been done, chiefly by working miners, and the amount of gold obtained has been so considerable that it is indeed surprising that the workings were so soon abandoned, but the causes are not far to seek. The holders of this class had not sufficient capital to carry on the work when the sinking became hard, and were obliged to desist as soon as the gold obtained was insufficient to cover working expenses. They were too late in the field to get help from capitalists. People speculating in a legitimate spirit had been induced to form the wildest hopes—the facility of their elevation was as unreasonable as the depth of their depression—and the consequence is that they cannot be induced to invest money in mining on the same conditions of success as in ordinary business, judicious investment in operations undertaken with skill and judgment likely to produce a fair business profit.

Quartz workings.

City of Sydney, Tuena.—Lease, 5 acres; deepest shaft, 180 feet; tunnel, 275 feet; reef, from 2 to 19 feet wide; "underlay" west dip of gold, north; crushing plant very valuable, cost £3,000; 1,200 tons stone crushed, average, 7 dwts. 2 grs. per ton.

United Miners Co., Tuena.—3 leases; 15 acres; no defined reef; crushing battery, 10 stamp heads, engine 10 h. p.; 300 tons stone crushed; gross yield, 50 dwts.

At Junction Point.

The Washington (Prospectors).—Lease, No. 569; Towns & Co.; length along line worked 320 feet; depth, 200 feet; average width, 2 feet 6 inches; crushing battery, 10-stamp heads, engine 12 h. p.; 5,600 tons stone crushed; realized £25,000; strike of reef N.W. by S.E.; dip, 1 in 3.

Washington Reef, No. 1 North.—Lease; abandoned; shaft, 80 feet; driven 80 feet.

Washington, No. 1 South.—Abandoned; tunnel, 96 feet; and shafts, 80 feet and 90 feet.

Washington, No. 2 North and No. 2 South.—80 feet shafts on each line; failed to find reef.

Victoria Reef.—Prospectors' lease; abandoned; length line worked, 300 feet; depth, 100 feet; average width, 18 inches; strike of reef, N. and S., almost flat; 2,000 tons stone crushed; amount realized, £9,000.

Victoria Reef, No. 1 North.—Length worked, 100 feet; depth, 125 feet; width, 18 inches; 500 tons crushed; yield, $\frac{1}{2}$ oz per ton.

Victoria Reef, No. 2 North—"Charley Bath's Luckey Hit."—No reef; shaft, 250 feet.

Royal George, Lease No. 2,242.—8 acres; length opened, 80 feet; depth, 80 feet; 200 tons crushed; yielded about 13 dwts. per ton.

Lease No. 4,434.—Reef unnamed; length opened, 50 feet; depth, 186 feet; 50 tons crushed; yielded 13 dwts. per ton.

Royal Standard.—Length opened, 100 feet; depth, 70 feet; 400 tons crushed; yield about $\frac{1}{2}$ ounce per ton.

The Phantom Lease (No. 582, *cancelled*).—Length, 300 feet; depth, 180 feet; width, 1 foot; Strike, N. and S.; 1,000 tons crushed; average, 1 oz. per ton.

Stockyard Reef.—20 feet opened; depth, 150 feet; 400 tons crushed; average, 1 oz.

"Golden Chain."—Lease; abandoned; length, 40 feet; depth, 40 feet; average width, 1 foot; 20 tons crushed; average about 8 dwts.

Blue Jacket.—Abandoned; length, 30 feet; depth, 35 feet; width, 4 inches; 20 tons crushed; 7 dwts. average per ton.

Great Britain.—Shaft, 50 feet; 60 tons crushed; average, 15 dwts.

Hit or Miss.—(Lease No. 4,489, *cancelled*); Length, 200 feet; depth, 90 feet; one crushing; average 15 dwts. per ton.

The Dog Trap.—(Lease No. 5,373); abandoned; length, 80 feet; depth, 40 feet; 100 tons crushed; average, 1 oz.

There are numerous reefs on Mr. Jones' private estate at Tuena, but none are now in work.

BATHURST DISTRICT.—CARCOAR DIVISION.

(*W. Badcock, Mining Registrar.*)

No new gold mines have been opened in this district during the past quarter, but those in actual work have produced about the same quantity of gold as in the quarter ending September 30—there being a difference in favour of the quarter just expired of about 80 ozs. Gold mining operations have been much retarded during the last two months by the want of water occasioned by the severe drought. The prospects of copper mining in the district are good. The mine at Milburn Creek is turning out good ore at considerable depths, with every prospect of improvement. During the quarter a new mine has been opened on Mr. Icely's estate by Messrs. Lloyd and Samuel, and about 100 tons of excellent ore (some of which has assayed over 40 per cent.) is now at grass.

A great stimulus will probably be given to all mining operations during the present year by the great influx of diggers to the Mandurama rush, which will cause a great deal of prospecting to be done on all adjacent Crown Lands.

BATHURST DISTRICT.—COWEA DIVISION.

(*John Arkins, Mining Registrar.*)

Nothing to add to last report. There are a few persons prospecting at Wood's Flat, and from expected rush to Mandurama Creek, on Mr. Icely's property, situated about eighteen miles from Wood's Flat. It is expected that locality will be well prospected. Residents here have expectations that a good field will be found at Wood's Flat, as large nuggets weighing respectively 70 ozs. and 50 ozs. were procured there a few years back, and locality has never been properly tried.

BATHURST DISTRICT.—OBERON DIVISION.

(*Chas. W. Cunningham, Mining Registrar.*)

THERE has been a falling off in the quartz reefs this quarter. There are only two reefs at work near Oberon at present, and two at Breakfast Creek, O'Connell. Several claims have stopped work, and the miners left. There are only about fifteen miners at work at present. The gold buyers of Oberon have purchased 215 ounces of gold during the year.

BATHURST DIVISION.—MITCHELL'S CREEK DIVISION.

(*Samuel Shumack, Mining Registrar.*)

THERE has been very little doing here for the past year. We have only two parties that are just now doing a grand business, that is Mr. Robertson, who is always working his own plant and doing well, and Mr. Winters, from Wallerawang, now of this place. He is doing

wonderful on the claim lately so long disputed by Mr. Cox, of Sydney. This claim has been prospected by several parties and abandoned till Winters took it up. It has turned out the best ever found about here—not for superior gold, but the stone is got without much labour. There are tens of thousands of tons of quartz in all directions here that would pay a large crushing power well from 6 dwts. to 14 dwts., and I have known some patches as much as 1 oz. I have no doubt but that all these will be crushed some day. We have no men of capital about here. This place seems neglected; but there is certainly a fine stand here for a company to work all these poor quartz, which in the opinion of all the experienced miners would pay well.

TAMBAROORA AND TURON.—HILL END DIVISION.

(*F. C. Macarthur, Mining Registrar.*)

THE information supplied in a tabular form is not so perfect as I could have wished, and principally from the fact, that returns of this kind have not before been asked for from the miners and mining managers, consequently, in most cases, they have never kept any records from which statistics could be compiled. I have now informed them that at certain periods they will be asked for the necessary statistical information from the mines they are connected with, and with one exception of a mining manager who informed me "He could supply me with no information unless he was paid for it," I have had every assistance, and have received assurances that in future sufficient records will be kept to supply the necessary information.

I shall now offer some explanation respecting the tables.

It is difficult to ascertain the exact number of miners in the division, especially those who are working the alluvial. The number of miner's rights is—European 682, and Chinese 99; this is, however, no true criterion of the number of miners at present working here, as a number of them are men who are constantly travelling from one gold field to another, though to make up that deficiency in numbers there are men who are constantly at work as miners without having obtained a miner's right.

I have made careful inquiry as to the cost of plant in each case, and the valuations given are those of men who own machines themselves, whose business is in connection with them, and who have resided in the district since the machines named were erected. With regard to their value it varies constantly—according to the work the machine has to do, its position, and the prosperity of the district generally.

I have annexed returns of gold from certain parcels of quartz raised in some of the principal mines in this division, and also the enormous yields of gold obtained from the Hawkins Hill veins. Most of this information has been supplied by the courtesy of Messrs. Pullen and Rawsthorne, who have furnished me with much valuable information.

I have procured returns of quartz crushed during the quarter, from the Hawkin's Hill Quartz Crushing Co., and the "Enterprise" battery, also from Vickery's battery since its purchase by Mr. Beyers. Mr. Thomas Chappell, who has a plant here, but does not crush for the public, is the only person who has been treating tailings to any extent, and he has supplied the information given. He informs me that 3 dwts. to the ton is about the average yield. No pyrites have been separately treated here.

I am unable to obtain the exact depth of the "Great Western Undaunted," as the company have suspended operations for some time; it is supposed to be 516 feet. Carroll and Beard's shaft is down 509 feet perpendicular, and a winze is going down about 30 feet from a cross-cut at the 500 feet level. Paxton's main shaft on the Star of Peace vein is down about 500 feet, about 200 of this is perpendicular. The "Star of Peace" is stoping down to 480 feet on the "Star of Peace" vein. "The Patriarch" is driving from their perpendicular shaft, which is about 380 feet deep.

There is at present little or no alluvial mining here, the surface is generally impregnated with gold in small quantities, but the impossibility of bringing water to bear on it renders it valueless.

No reliable information can be obtained as to the quantity of alluvial worked, it being mostly carried on by Chinamen in a fossicking way. During the winter months a few Europeans do a little sluicing by means of storm water, but the want of water storage obliges

them to suspend operations as soon as the rain ceases, and the richest ground having been worked and re-worked years ago, what is left will not pay to take to puddling machines of which there are three small ones here.

I can obtain no trustworthy information respecting nuggets. Except at Sweeper's Creek it is now a rare occurrence for even coarse gold to be found in this district. In the early days of this gold field many large nuggets were discovered, but I can obtain no reliable information as to their size, weight, or even exact locality where found. The nugget mentioned in the schedule was found at the Pyramul, 20 miles from here, about four years ago, but I can obtain no further information than that given, no record having been kept at the time.

GENERAL REMARKS.

There are no tin, copper, or iron mines in this division that I am aware of. There is, I am informed, a seam of coal between here and Sofala, which has not been opened, but I have hitherto been unsuccessful in obtaining particulars as to its exact locality, character, &c. There are no deep alluvial auriferous deposits known in this division, or indeed in the district, but there are numberless auriferous gullies and creeks, where the sinking has been shallow, and the beds of the Turon and Macquarie Rivers have been worked and reworked for many miles. It is almost impossible to give the extent of the abandoned alluvial diggings in this division. I should, however, estimate it to be about 50 square miles. A considerable number of Chinese are still working in parts of the Turon River, Tambaroora Creek, and other abandoned ground, as Europeans are not satisfied, and in fact cannot make wages from the small amount of gold won from these old workings. For miles round Hill End and Tambaroora there are gullies and creeks, which have been worked in the early days of this field, and in many instances have yielded large quantities of gold. The alluvial workings in this division have been, I am informed, worked in some places to a depth of 40 feet before bottom was reached, but the average is about 10 or 12 feet. The mode of working has been of the simplest character, pick and shovel, and washing-up in a cradle or occasionally a pug mill or puddling machine. There is no doubt whatever that a very large extent of ground in this division would pay handsomely for sluicing if a sufficient permanent supply of water could be obtained. During the winter months a small quantity of sluicing is carried on by storm water, the probable returns of which I believe average 12 grains to a pennyweight per load.

Ullamarrah or Pulley's Bald Hill, 12 miles west from here, on the north-east bank of the Macquarie River, is the centre of a run table-topped hills from 400 to 500 feet above the level of the river. They are capped with basalt, beneath which is an auriferous deposit consisting of quartz pebbles and boulders; in some places a wash, in others cemented together. It is from 10 to 20 feet thick, with a pipeclay bottom, and runs to the surface, though apparently dipping as it enters the hill. This deposit has received attention for years past, but owing to the depressed state of mining here, it is now coming more prominently forward. Some years ago a tunnel was put in by Dr. Fischer, since then limited operations for the purpose of testing the wash have been carried on, but no reliable estimate of its value could be formed, as the operations were not calculated to deal with the gold, which is known among the miners as "*scaly*" gold, and is not easily saved by sluicing. Several tunnels are now being put in with a view to test it at a battery, and in my next report I hope to be able to give a better idea of its value. I may remark that the formation extends to a distance of about 40 miles along the banks of the Macquarie River and Ophir Creek, and should it turn out as is hoped will give employment to a vast number of men and extensive machinery.

I annex a schedule marked K of the principal veins in the division that have been opened, with such particulars as I could obtain. I am, however, unable to supply the samples in triplicate of stone from each vein as requested; I shall do my utmost to obtain them, but anticipate some difficulty in consequence of many of the reefs not now being worked.

The mode of treating the quartz is by crushing in batteries with the ordinary amalgamation process. No new methods have been introduced here.

On Hawkins' Hill the quantity of waste approximately is about 40,000 tons, estimated to yield about 2 dwts. to the ton. Of the waste in the whole division I am unable to form an estimate.

I append a schedule L, showing as nearly as can be obtained the quantity of gold won in this division during the twelve months ending 31st December, 1875. This has been supplied me by the Gold Receiver here, as all gold, whether purchased by Banks or private buyers, is invariably sent by escort through him, and the majority of returns sent me by the gold buyers were neither complete nor satisfactory. The gold in this division is much above the standard value, some of it bringing as much as £4 2s. per oz.

In conclusion I wish to offer, a few remarks on the state and progress of mines in this division. Here as in all parts of the Colony, mining in all its branches is in a very depressed state, and though some months since there were signs of recovery here, various forfeited leases having been taken up and prospected by parties of working miners, in almost every instance, after some months work, they were again abandoned in consequence of their inability to obtain payable gold. This arises in many cases no doubt from their want of funds to prosecute sufficiently intended researches.

Of the hundreds of claims started in this division during the last five years, the following only are now at work on Hawkins' Hill:—Carroll and Beard's, Khroman's, Rawsthorne's, Star of Peace, Paxton's, Monte Christo, Cock, Attwood, and Dwyer, Beyers and Holterman's, Herman's, Matthewson's, Hickson, Crichton, and Beard's, and Brown's, the three latter of which are on tribute, and I understand at present are confining their operations to cleaning and skinning the old workings. In the immediate neighbourhood of Hill End the following companies are at work:—The Excelsior, Lombard Street, Cornish, Frenchman's, Eureka, Dragon, and Patriarch.

I attribute this failure not to the want of gold, but to the very evident incapacity of *many* of the persons who had the immediate superintendence of the mine (so-called mining managers). The almost invariable idea in these bubbles seems to have been to put down a perpendicular shaft to strike the reef on the underlay at 200 feet, at about which depth the richest shoots of gold in this district have been found. In very many instances the workings have been abandoned before this depth has been reached, and when the depth has been attained without striking the vein sought; in very few cases have crosscuts been put in to find it. In other mines that were started, when the reef was struck about the depth intended, if payable gold was not immediately found, work was suspended, without thoroughly testing and prospecting the ground by driving, &c. The reefs here can be traced on the surface for miles, and the payable gold yet obtained is known to run in shoots, consequently the chances of striking it by sinking a perpendicular shaft 7 feet wide in a reef a mile long are exceedingly small.

Everything here in the way of mining, during the rush of 1872, was taken up in a hurry, and again dropped in a hurry, many people having *large* interests in many different companies, finding they were not able to pay into all, drew off completely, consequently the stoppage of work in shafts and tunnels before reaching the vein sought.

The greater number of mines on Hawkins Hill proper are, I understand, about to suspend operations; their present payable run or shoot of gold has been worked out, and their very limited area does not warrant their seeking fresh runs of gold at greater depths. From my own observations nothing will tend so much to revive the prosperity of this locality as the amalgamation of the mines on Hawkin's Hill proper, where the area of the claims ranges from 30 to 150 feet in length along the course of the veins. I look upon the present depression as tending towards this end, in that it must force amalgamation on those who have hitherto resisted every effort to bring it about.

Of the mines before mentioned on Hawkin's Hill proper Paxton's are sinking their main shaft on the Star of Peace vein; the Star of Peace is at present stoping at their 500 feet level, and I understand propose sinking as soon as they can do so without interfering with their stopes; Carroll and Beard's, Beyers and Holterman's, and Khroman's are about to confine their operations to sinking one deep shaft, probably from Carroll and Beard's claim, where there are greater facilities in steam, winding gear, &c. By this it will be seen that prospecting on Hawkin's Hill is really confined to Paxton's, Star of Peace, and Carroll and Beard's, while off the hill and more in the vicinity of the township there is the Patriarch, Cornish, Eureka, Lombard-street, and Excelsior, all of which may be said to be prospecting. There are some few other Companies and private claims at work, but only on known veins.

The confidence of the people who are well acquainted with the district is still unshaken, and there is no reason to doubt that there are still in the many surrounding miles of highly auriferous country, at a greater depth than has yet been attained, shoots of gold as rich as any hitherto discovered here.

It will take many years to thoroughly prospect those mines now opened, and at the present rate a very much longer period to thoroughly prospect this division, the miners getting little or no support from men of means, who, unless on the spot, are naturally loth to invest in gold mining.

TAMBAROORA AND TURON.—SOFALA DIVISION.

(*H. Bridson, Mining Registrar.*)

I HAVE no means of knowing the quantity of gold and other minerals raised in the district of Sofala.

The gold sent by escort the last three months of 1875 is as follows:—

	ozs.	dwt.	grs.
October	891	5	9
November.....	534	18	18
December.....	739	16	10
	<hr/>		
	2,166	0	13
	<hr/>		

A party of three miners obtained some nice coarse gold during Christmas week in Jew's Creek, near Middle Creek, about 7 miles from here, down the river. One piece weighed over 9 ounces.

There has been a new rush to a creek from 7 to 9 miles hence, near to the main road from here to Mudgee. I understand there are from three to four hundred miners there; some are getting coarse gold—the majority are leaving. I believe a run of gold will be found from the top of the ranges at Dam Creek, near Millamurrah, northerly to Middle Creek, Jew's Creek, and on to the new rush on the Mudgee Road.

The races in the banks are all nearly dry for want of water, and those parties who have races in the river are complaining of scarcity of water.

Mr. L. E. Johnson, who is erecting new quartz crushing machinery on the Crudine Creek, is satisfied with his prospects, and trusts to have his machine in working order next month. Parties on the Quartz Ridge are taking up fresh ground.

On account of the continued dry weather the large sluicing parties are at a standstill.

The quantities of ground applied to lease and not taken up have deterred a number of miners from working, and they have removed to other diggings. The puddlers at Wattle Flat are idle for want of water.

MUDGEE DISTRICT.—GULGONG AND HOME RULE DIVISIONS.

(*Alfred F. H. Stephen, Mining Registrar.*)

THE Statement herewith of the number of miners employed and the amount of gold won in the Gulgong and Home Rule Divisions of the Mudgee Mining District, shows a considerable decrease; the chief cause is, that most of the old leads have been worked out,—but the want of capital amongst the miners, the lack of enterprise amongst the capitalists, and the system of leasing small areas of ground, have helped most materially the present depression of the mining interest.

Nearly 16 tons of gold have been sent away from Gulgong, per escort, since the 10th May, 1871, which at the average price of £3 15s. 6d. represents £1,602,403. The yearly amounts were as follows:—

	ozs.	dwts.	grs.
1871.....	76,315	0	12
1872.....	184,455	16	1
1873.....	120,552	11	16
1874.....	68,354	19	15
1875.....	32,073	13	2

The following information has been collected respecting the various leads and reefs:—

Black Lead, Gulgong.—The area worked is about 960 acres, average depth of sinking 140 feet. The wash-dirt which averages 300 feet in width by a depth of 1 foot consists of quartz debris, with an average yield of 1 oz. per load. The highest yield was 10 ozs. to the load. Mr. John M'Lachlan has supplied the following:—"M'Lachlan and party's No. 24, worked by a whim, is the last claim now working on the downward course of the Black Lead; the dirt is poor and there is a heavy body of water to contend against. The Black Lead has suddenly become poor here, owing to the wash which contains gold having spread itself over a wide plain—it is possible however, that it may yet be discovered in a narrow channel by this party."

Mr. Arthur Boyle (a shareholder in No. 44), supplied the following:—"The main gutter of the Black Lead has not yet been discovered*** The Happy Valley, Black Lead, Star, Cosmopolitan, Dead Man's, and several other well known rich leads seem to converge towards the leases of this company, and in the event of a payable deep gutter being proved a new era of alluvial mining will be inaugurated on the Gulgong Gold Field."

Happy Valley, Gulgong.—Area, about 680 acres. Average depth of sinking 130 feet. The wash consisting of quartz debris was about 160 feet wide by an average depth of 15 inches—yielded 1½ oz. per load. The richest went 12 ozs. to the load. This lead is worked out, and there are now only a few parties fossicking there.

Caledonian Lead, 2½ miles west of Gulgong.—Area, about 80 acres. Depth of sinking 110 feet. Wash-dirt was about 100 feet wide by a depth of 6 inches. Average yield 5 dwts. This lead is worked out.

Perseverance Lead, 3 miles west of Gulgong.—Area, about 240 acres. Sinking was from 50 to 120 feet. Wash yielded from 4 dwts. to 2 ozs. to the load. Almost worked out.

Nil Desperandum Lead, 5 miles S.E. of Gulgong.—This is the most flourishing lead in the district. Area, about 140 acres. The depth of sinking averages 90 feet, but the deepest workings are at 180 feet. The wash which consists of pug and gravel is 20 feet wide by a depth of from 18 inches to 20 feet, and yields from 3 dwts. to 1½ oz. to the load. About 1,000 loads are raised per week.

Canadian Lead (adjoining the Nil Desperandum).—Area, about 150 acres. Average depth of sinking 120 feet. The wash consisting of pug, stiff clay, and boulders, varies in width from 20 feet to 100 feet by 5 to 50 feet in depth. The yield averages 6 dwts. per load.

Home Rule Lead.—Area, about 320 acres. Sinking averaged 133 feet. The wash-dirt was about 150 feet wide by about 18 inches deep, and yielded from 10 dwts. to 2 ozs. per load. Nearly worked out.

Christmas Lead (Home Rule).—Area, about 60 acres. Sinking about 85 feet deep. This lead is entirely abandoned.

Shallow Rush (Home Rule).—Area, about 500 acres. Sinking about 180 feet. The wash-dirt is about 100 feet wide and 18 inches deep, and the yield averages about 2 ozs. to the load.

Red Lead (1 mile north of Home Rule).—Area, about 100 acres. Sinking averaged about 140 feet. The wash was 50 feet wide and 1 foot deep, and yielded from 6 dwts. to 15 dwts. Nearly abandoned.

The Moonlight Lead, 1 mile north of Gulgong, has been abandoned as non-payable.

Welcome Reef, "Three Mile"—Gulgong.—This reef has been worked about 300 feet in length and has not yet been struck outside Mallinson and party's lease. They have sunk 160 feet and have payable stone at that level. The reef is from 2 to 4 feet wide and yields an average of 10 dwts to the ton. In the adjoining claim a leader has been struck and the party are sanguine as to cutting the Welcome Reef speedily. The underlay is 4 feet in 6 feet.

Old Gulgong Reef, 3 miles E. of Gulgong.—This is the deepest quartz mine in this district, the shaft being down 230 feet. The reef has been worked for about 500 yards, and is now almost abandoned. A lease of it has been applied for. The average width of the reef is 2 feet, and yields about 12 dwts. per ton. It bears N. and S., and the underlay is to the E. about 1 in 3.

Lousiana Reef, near Old Gulgong Reef.—Shaft down about 125 feet. Three 8-acre leases, proved and abandoned. Several gold-bearing leaders have been struck in the shaft, which have yielded from 8 to 17 dwts. per ton. This reef has been abandoned.

Mariners' Reef, 600 yards E. of Old Gulgong Reef.—Shaft down 35 feet. Reef 6 inches to 3 feet wide; has yielded 7 dwts. to the ton; runs N. and S.; underlay to the W. 1 foot in 4 feet.

British Lion Reef, Leaning Oak Creek.—This reef is worked for about 600 feet. The average width is 6 inches. It has yielded from surface to 100 feet level, 1 oz. per ton; at 100 feet level it yielded $2\frac{1}{4}$ ozs., and at the lowest level (200 feet) the yield has been $3\frac{1}{4}$ ozs. per ton.

Morning Star Reef, Leaning Oak Creek.—This reef has been tried for about 4 miles with payable prospects. A small crushing from the surface yielded 1 oz. 2 dwts. per ton. The deepest shaft is down 40 feet, and the width of the reef is 10 inches. The proprietors report this as the "best show" in the district, and expect to crush 100 tons very shortly.

At the "Lily May," near Home Rule, it is said a party has got indications of a good reef.

There is a large extent of deep ground in these divisions of which many experienced miners have a high opinion, but the sinking and bailing is too expensive for the working miner without the aid of capital.

Belara Copper Mines, 20 miles W. of Gulgong.—About 100 acres show indications of copper. The shaft is down 110 feet, and the lode is 10 feet wide.

MUDGEES DISTRICT.—MUDGEES DIVISION.

(*George Leary, Mining Registrar.*)

THE only places within my division of the Mudgees Gold Field now being worked are situated at Budgee Budgee, Apple-tree Flat, and Leaning Oak Creek.

Budgee Budgee is an old alluvial digging, about 7 miles from Mudgee. It is nearly worked out. The claims are worked on the block system. The average sinking is 60 feet. Five claims are now being worked.

Apple-tree Flat is an old abandoned diggings, situated on the Cudgong River, about 12 miles from Mudgee. There are only a few miners fossicking about it.

Leaning Oak Creek is about 17 miles from Mudgee, and consists of a lot of quartz reefs. There is only one of the reefs worked at the present time, "The British Lion."

There were formerly some very good crushings obtained from this reef. It has been let on tribute by the original holders. During the last year it yielded as much as 6 ozs. to the ton. From the last crushing of 30 tons of stone, 80 ozs. of gold were obtained.

The reefs in this locality are supposed to be very rich.

MUDGEES DISTRICT.—WELLINGTON DIVISION.

(*Frederick Marsh, Mining Registrar.*)

1. *Jawbone and Mitchell's Creek.*—No alluvial leads or deposits now being worked.

Abandoned workings.—Jawbone, about 3 miles in length, by a $\frac{1}{4}$ of a mile in width; character of deposit, drift at depth of 33 to 60 feet; gold found in patches; yield from 1 to 12 dwts. per load.

2. Six quartz reefs partially opened; only one being worked, viz.:—The Mitchell's Creek Gold Mining Co.—about 20 men employed; length of line worked, about $\frac{1}{2}$ of a mile; depth reached, 130 feet; reef about 20 inches wide; average yield throughout, about 9 dwts; strike of reef, north and south, 2 points west, dip to the east.

Unopened Reefs.—Large numbers cropping out in all directions, stone from several showing gold.

Particulars of abandoned Reefs.—Several partially opened and sunk to depths of from 10 to 80 feet; no results through want of machinery, and samples of stone too poor to send to any distance to be crushed.

Particulars of reefs or loads not opened as far as can be estimated from surface indications. A good few show that they are gold-bearing.

The mode of treating material at Mitchell's Creek, is by quartz fifteen-head battery, copper plates, blankets, and buddles; quartz operated on averaging 9 dwts; no new mode of treatment in use; about 9,000 tons of tailings stacked.

Copper lodes.—Several in different parts, but unworked through not offering sufficient inducement as to quality.

NOTE:—The number of square miles which have been worked over it is not easy to say, but a very large area of country has been tried; the miners at present at work being very scattered. I may say that the Bank of N. S.W. is the buyer of the gold raised, and I am informed by the Manager, that the quantity is about 130 ozs. per month.

QUARTZ.

MUDGEES DISTRICT.—HARGRAVES'S DIVISION.

(*W. McManamy, Mining Registrar.*)

The Main Axis Reef.—Situate in the town of Hargraves, justly deserves first notice. This reef is one of great interest, for the reason that the first large deposit of gold found in Australia was discovered in its surface quartz. Here it was that Dr. Kerr's "Blackfellow" in July, 1851, saw the "shining thing" that afterwards proved to be a mass of gold, value five thousand pounds (£5,000.) On the surface is seen a large blow of quartz, extending about 200 yards, and of a width in some places of 10 yards.

The "Great Nugget Vein Company" crushed some thousands of tons from this blow during 1853, and following years, till they broke up. Some of the stone yielded as much as 30 ozs. to the ton, but the average was about 3 dwts.

Mr. Thomas Chappell succeeded this company; he carried a shaft commenced by the company (and by them put down to 60 feet) down to 200 feet. He failed to be recompensed for his outlay. Water seems to have forced him to abandon work. Mr. Chappell, who has been largely engaged in mining at Hill End, since his experience at the "Main Axis Reef," expresses now his opinion that a reef of great richness underlies this ground. Mr. Pullen, about the same time, went down on some leaders, and obtained payable results.

Another party consisting of Dr. Street and two others, commenced a prospecting shaft 6 feet x 2 feet 6 inches in 1858, which was put down 60 feet; at that depth Dr. Street says, "A reef was struck, which was 4 feet 6 inches thick and carrying gold. A second prospecting shaft was put down to the depth of 127 feet. This shaft is about 40 feet east of the first; at 84 feet a vein 2 feet 8 inches thick was cut, dipping to the west. At 91 feet a second vein 6 inches thick was passed through, it also dipping to the west, and at 102 feet a third vein was met 4 inches in thickness.

At the depth of 127 feet a drive 71 feet was put in to the west, in which the veins cut at 91 feet and 102 feet in the shaft were found again. The 91 feet vein had increased to 18 inches, and the 102 feet one had increased to 15 inches. Both showed gold freely. At the head of the drive the 2 feet 8 inch vein was drilled into, but the pressure of water became so great that a whim, worked by horses day and night, failed to overcome it, and since then no further work has been done.

The 106 lbs. weight of gold discovered by Dr. Kerr's blackfellow was found about 30 feet west of the 60 feet shaft. Dr. Street, the present owner of this mine, called the "Sir Roderick Murchison Great Quartz Reef," kindly lent the mining registrar a plan showing section through shafts, of which a copy has been taken for the department. The original was made by Mr. Coates, mining surveyor.

During 1872 leases were taken up east, west, north, and south of the old leases, on this reef. Several shafts were sunk, and leaders were found carrying gold, but no large reef was come upon. The whole, old and new, are now unworked.

Dr. Street points it out as remarkable that more nuggets, and larger ones, have been found within a radius of a quarter of a mile of this reef, than have been found in any other part of New South Wales. He estimates that specimens and nuggets to the value of twenty thousand pounds (£20,000), have been obtained from a short and narrow gully on the western side of the reef.

Mr. Turner, a miner resident at Louisa Creek, informed the mining registrar, when making inquiry for the purpose of this report, that he saw in the possession of a miner, known as "Darby," a 26 lb. nugget, which was found close to the reef in 1852. And at the time the ground was opened to the diggers generally—after the Company gave up—he says that the finding of nuggets was of daily occurrence. At this time he knew of a miner, called "Cork Jack," finding a 6 lb. and a 3 lb. nugget in the same gully. Another miner, named Bryant, found two pieces, total 89 ozs. Jim Reid found a nugget, value £300. "John the Dutchman" found one, value £400. Bill Winnan found one, value £300. Turner himself found a lump of gold and quartz which weighed 197 ozs., which sold for £400. He also found one 48 oz. nugget and one 25 oz. nugget, and as many as fifteen "bits" of gold varying from 4 ozs. to 10 ozs., all in the gully west of the reef. The deepest sinking was 15 feet, the average about 8 feet.

Turner saw a find by two diggers, whose names he cannot recall, of a mass of gold and quartz which weighed 5 cwt., requiring four men to carry on hand-barrow. Where this was found was about half a mile north from the "blow" of the reef. Mr. M'Gowan, another digger, residing at Hargraves, corroborates Turner as to the bulk of this piece. Turner states it realised (eleven thousand pounds) £11,000, in London.

The Scotch Hill Reef, about 400 yards west of Main Axis Reef, shows outcrops of quartz extending for more than a mile. No trial of this reef has yet taken place. Overlooks Louisa Creek, alluvial rich near this reef; numerous nuggets varying from 1 oz. to 50 ozs. found in vicinity.

The El Dorado line of reef, situate north-east of Main Axis Reef, distant about 1 mile, was put down by Haughton and party to a depth of 100 feet. Some very nice specimens were obtained from a leader near the surface. It is not being worked now.

Homeward Bound Line of Reef, situate about 2 miles north-west of Hargraves, near road to Maitland Bar. Rich quartz found near surface. Deepest shaft 90 feet, put down by Jones and party; sinking, sandstone. No work now being done on this line of reef.

Sawyer's Reef, situate about 2 miles north of Hargraves, on road to Avisford. Has been tried many times; latterly (1873) worked by a large party, and a tunnel 170 feet put in to cut reef. A vein was found, and it is said it would pay if there were machinery on the ground.

Tucker's Hill, situate west of Sawyer's Reef and near Meroo.—At this place was expended the greatest amount of money that has been spent in one place in the district of Hargraves. It is estimated that upwards of forty thousand pounds (£40,000) has been laid out in and about this Hill. The late Mr. Tucker put in a tunnel a distance of 400 feet and found nothing payable—the rock was very hard. During 1872 a company, the "Band of Hope," commenced working at the western side, opposite to Tucker's tunnel, and put in another tunnel nearly the same length, and were also unsuccessful. This company made great preparations. A powerful engine and battery were erected on the bank of the Meroo; a tramway nearly a mile long was formed from the engine to the mouth of the tunnel. The machinery is being removed to Mitchell's Creek. No one at work on this reef.

Great Western Pioneer Line of Reef, situate near Maitland Bar, north of Meroo River. Deepest shaft, 90 feet; vein nearly vertical, incline to east; average width of vein

10 inches, bearing gold from surface; vein found in all the four shafts. Mr. Spratt had one ton of average stone crushed in Sydney, which yielded 2 ozs.

Eaglehawk line of Reef, near Clarke's Creek, has been traced 2 miles north and south; numerous shafts sunk—the deepest 175 feet on the underlay; width of reef averages 10 inches, dip to east; crushings have yielded from 5 dwts. to 3 ozs. 6 dwts. per ton; sinking sandstone and slate. A tunnel has been driven in from east 260 feet; cut a reef at 40 feet 4 feet thick; no gold.

A cross reef from Eagle line, running east and west, has been prospected to a depth of 105 feet; straight shaft; vein averages 10 inches, and has yielded from 16 dwts. to 3½ ozs.; sinking, sandstone, granite, and slate; makes a deal of water.

All this country now unworked. Quartz contains mundic, pyrites, galena.

The Ding Dong Reef, at Campbell's Creek, worked about 6 years ago; traced on surface 100 yards; shaft 60 feet on underlay; vein, average 10 inches, yielded 1 oz. to ton; sinking soft, clay slate. Now idle.

Dog Trap Reef, at Warratra, Upper Meroo; shaft 80 feet; cut reef, no gold; schist formation; cutting tried 14 feet; vein 16 inches wide; yielded 7 dwts. to ton. Now unworked.

ALLUVIAL WORKINGS.

Meroo Creek, main watercourse in Hargraves division, rises in the dividing range, west of Mudgee Road, near Cudgegong Township, follows westerly course to its junction with Cudgegong River, 3 miles west of Merrendee; total length about 45 miles. Gold has been found in all that distance, and in some places extraordinarily rich. At Richardson's Point, near Windeyer, 4 and 5 ozs. to the bucket have been obtained. The majority of the diggers now are Chinese, who work in parties, numbering in each from four to as many as twelve. On the day the Mining Registrar was making inquiry at Windeyer, in connection with this report, a Chinese party of four sold £24 worth of gold, being the yield of two weeks' labour. The European diggers are mostly engaged going over the old workings.

Grattai Creek, tributary of Meroo, junctions with it at the "World's End." A few diggers scattered along it.

Louisa Creek, tributary of Meroo, rises in the range south of the town of Hargraves; about 7 miles long, very rich when first opened; deepest sinking 15 feet. Run of gold found in creek, which was about 6 yards wide; gold found in the flats near the creek; about twenty diggers, European and Chinese, now at work.

Louisa Ponds Creek, junctions with Louisa Creek, near north-western boundary of town of Hargraves; about 2 miles long. Large quantities of gold have been found in its banks and along its course. Between these two creeks is "the Main Axis Reef," five pug mills, now at work.

Clarke's Creek rises in Boiga Mountain Range, follows northerly course to junction with Long Creek. Has been dug over to about 4 miles above junction; deepest sinking 15 feet; gold coarse, but very free from alloy, £4 0s. 3d. per oz. has been obtained at Mint after deducting all charges; nuggets have been found varying from 1 oz. to 37 ozs.; diggers now going over old workings.

Long Creek, tributary of Meroo, junction east of Windeyer; 10 miles long, towards Upper Pyramul; gold has been found the whole of its length; the sinking has been from surface to 32 feet; ground very rich when first opened—4 ozs. to the dish; gold very free from alloy; nuggets have been found varying from 1 oz. to 17 ozs.; diggers going over old workings.

Campbell's Creek, tributary of Meroo, rises in range near Mudgee Road; follows westerly course to its junction with Long Creek; gold has been found payable for a distance of about 8 miles from the Meroo; deepest sinking 30 feet; gold coarse and water-worn; no nuggets of any noticeable weight have been found; diggers at present time going over old workings.

LACHLAN DISTRICT.—FORBES DIVISION.

(F. S. Osborne, Mining Registrar.)

THE principal lead in this Division is Mathieson's, at the Bald Hills, 3 miles from Forbes; there are seven claims on gold; the depth of sinking is 172 feet to 178 feet; width of wash 25 feet, with water to contend with; they are worked by whips. The tracing of this

lead is very difficult, there being two runs, one auriferous and the other not, running almost parallel. I am sorry to say this lead, so far as tested, has not turned out according to expectation, the best claim washing only $\frac{1}{2}$ oz. to the load, and others only 2 to 3 dwts. to the load; the lead is now nearly abandoned, the bottom being of a spongy nature, and a great deal of water to contend with, and the great depth to draw same (175 feet) is the reason of abandonment, nothing less than 1 oz. to the load would pay with present appliances. A party is being formed to take up the best of the ground as an extended claim of twenty-five acres.

The Lagoon Lead.—This lead was worked about eleven years ago, and abandoned; the prospects were 6 dwts. to the load, but wages at that time being £6 a week in wet ground, it was abandoned. It is now taken up as an extended alluvial claim of 10 acres. No. 1 also is 10 acres in extent, they have bottomed and driven across the gutter, but could not get anything payable, they therefore removed half-a-mile south, on what they call the Madman's Lead, a very rich lead years ago, when the lead was lost. They have sunk a shaft 95 feet in depth, but it was too shallow and they had to drive and sink a monkey shaft, when they struck gold, and are now opening out and can get very good prospects, as much as 16 dwts. to one small bag of wash-dirt, and it is to be hoped that they have struck the continuation of the old lead, which went in some instances as high as 4 ozs. to the load. The wash is 4 about feet in height.

On the Union Lead, close to the town of Forbes, there is a party of eight men surfacing, they are taking all before them, and crushing it at Consol's Machine, Forbes, it averages about 4 to 5 dwts. to the load, and being only about half-a-mile from the machine, pays them very well; they have already crushed about 130 tons, and are well satisfied. Other parties would have taken up the ground adjoining, but it is upon a lease.

There are a great many miners out prospecting in this division, but have not yet reported anything.

Strickland's Reef, near Forbes, has had a crushing of 90 tons of stone at the Consols Company's Machine, at Forbes; the crushing went $\frac{1}{2}$ oz. to the ton, which is payable, as they have a great thickness of stone, now 5 feet, but they consider they have lost a great deal of gold on account of pyrites being in such large quantities with the stone. They have 2 tons of pyrites saved from the last crushing, and intend to save them for the future to see if they cannot find a method of extracting the gold therefrom. They are now down 107 feet with their shaft, and intend shortly to have another crushing.

There are two extended claims taken up, one on the north and the other on the south of this claim, of 10 acres each, and are now sinking to find the reef.

I am sure this reef would pay handsomely if there was any way of treating the pyrites, but with present appliances they lose more than half the gold. The average width of the reef is 3 feet dip south, underlay east, worked by windlass at present; stone in triplicate under separate cover.

Foster's Reef, Cudgellico, worked by a company, known as the Foster's Reef Gold Mining Company; length of reef worked 150 feet, depth 95 feet, width of reef 3 to 6 feet, strike and dip north, engine 12 horse power, battery of 12 stamps, there is a great deal of water to contend with; they contemplate erecting pumping and winding gear, for which they have sent to Victoria; the reef is of sandstone formation; samples of stone could not be obtained as shaft is full of water; everything on this part of my division is at a standstill at present, and no alluvial has yet been found. There are still parties prospecting the Pinnacle reef, near Forbes, and one of the parties told me, when he obtained his miner's right, that he hoped shortly to report payable gold; that they were going to crush about 20 tons to test the reef; should the stone prove payable a great number of claims would be taken up in the vicinity, as good gold was obtained there before all the ground was leased.

All the best of the ground in my division being under lease, is the cause of so little mining being done; but when the leases are cancelled and the mines properly prospected, I am sure that there will be more gold to be obtained than was ever taken out of the ground in the old days of Forbes.

Abandoned Leads and Reefs.

As it is now so many years since the leads and reefs in this division were worked, it is almost impossible to give you the information you require under this head. I have visited them since my last report, and find all the shafts have fallen in and quite deserted, and no one living near to give me any information relative to the same.

There are no minerals other than gold, being worked in my division at the present time.

The mines in my division, although at present not very extensive, are in a healthy condition, and as soon as the leases are cancelled, all the old leads and reefs would be profitably worked over again. I have a great many applications for extended claims; but almost in every instance find that the ground applied for is on some lease or other, and would most respectfully suggest that the leases in my division should be issued as soon as possible, as there are a great many miners who are now idle here and at Parkes who would work the said leases if they were cancelled.

LACHLAN.—CARGO DIVISION.

(*R. Hutton, Mining Registrar.*)

DURING the last two months of the year the alluvial prospects on the Cargo gold field have not presented the same healthy appearance that they did in the earlier part of the year. There has been a slight falling off in the yield from some of the claims, which has somewhat checked the ardour of some of the miners, but the rush to Mandurama has been the principal cause. The floating rumours which have been in circulation about the latter place for some years have been so exaggerated that the miners in this locality seem to think that if they were allowed to work on that estate a certain *pile* would be the result; consequently, when the ground was about to be opened a feverish excitement seemed to take hold of every one, and none who were not doing very well indeed could resist the temptation to be off.

The alluvial in Cargo has not extended during the past year, and is still confined to Gum Flat, the vein or lode on which place (described in a former report) is very uncertain, being in some places so narrow as to be almost imperceptible, and in others so poor that it would not pay for working, and when any of the claims during the last two months have fallen on a place of this sort the owners have invariably stopped work, although in many instances in these same claims formerly narrow and poor spots have been sunk through, and good payable gold obtained afterwards, but when this was done there was no exciting rush in the locality. A rush to a new place, and particularly if that place is on private property, seems to have a fascination for the miner which he cannot resist.

Hicks's claim, formerly the best on the flat, is still doing well. The flat bottom which they had at 100 feet, and which extended over their entire claim, is worked out, and they have commenced on the vein which the adjoining party have proved to be good on the boundary to a depth of 200 feet, or 100 feet from where it was first struck. Their washings during the year have averaged 8 dwts. to the load.

Pendell's claim, late O'Donald's (the one alluded to as having proved the boundary of Hicks's), has paid well up to within the last fortnight, when the owners came on a narrow and poor place, and consequently struck work, and joined the rush to Mandurama. Some of the shareholders still retain their interest in the ground, and as soon as they can form a party intend to work it again. Their washings lately have yielded 6 dwts. to the load.

Mackey's party are working the top part of the vein. During the last six months they sank a shaft 240 feet deep, and drove in to the vein; they also cut it at 190 feet, but in both places it was too poor to pay; where they are working at present is paying wages.

Holden's claim was abandoned in the early part of the year, but the party have taken up another one, and are working the first bottom about 45 feet deep, which is paying small wages.

M'Key's claim is also abandoned, not payable. Odger's claim is now considered the best in the flat, not that it is richer in gold than the others, but from the large quantity of stuff they can raise; in this claim the vein has been proved deeper than in any of the others; their present depth is 245 feet, they have not however sunk any during the last six months, nor are they likely to do so for some time, as they have a great deal of ground (which they have prospected and know to be payable) to cut out, before they sink further. There are six men in the party, and are able to raise 15 loads per day, which has yielded during the last half year about 7 dwts. to the load.

The adjoining claim, viz., Hogan & party's has never paid well, they had a vein which paid wages for some time, and then cut out, it is their opinion, however (and also that of the

adjoining party) that this vein is not the same as that in Odger's claim; they have lately done a great deal of work to find it, but have not succeeded; the last shaft they sunk was 250 feet, they drove it some distance, but some of the party were without means, and the rush to Mandurama set in, so they struck work, and joined the throng to the fancied Eldorado. Some of them however intend to return, and try the ground still further.

Rickey and party's is the next claim, it is paying well. In this claim the vein was struck at 40 feet and it has been proved down to 160 feet. They also worked it up to within 20 feet of the surface; the width of the vein is from 18 inches to 3 feet, 7 dwts. to the load has been their returns during the last six months.

Groat and party's is the next claim, this is the furthest the vein has been traced down the flat. This party also struck it at 40 feet, and worked it up to within 20 feet of the surface, and down to 130 feet, where it was narrow and poor; they therefore left it, and like the others started for Mandurama; their washings during the last six months averaged 6 dwts. to the load. Part of this claim has been again taken up.

From these claims there has been during the last half-year 2,950 loads put through the puddling machines, and 1,040 ozs. of gold obtained. This is the proceeds of the alluvium in this field since the 1st of July. The gold is worth £3 14s. per oz., the net value would therefore be £3,848.

There has been nothing done during the year to trace the vein further at either end, nor has the granite formation yet been reached, so that the future of Gum Flat is as problematical as it was at the beginning of the year.

In Quartz Reefs there are four leases at work, viz. :—

The Ironclad G. M. Company, Ironclad Reef.

Matthieson & Party, Ironclad Reef.

Campbell & Party, Adelaide Reef.

Elder & Party, Victorian Reef.

The Ironclad Company's lease is the best on the field. Their shaft is now about 270 feet deep, which is the greatest depth attained in the division; the only difference between the appearance of the reef in this property now and at the beginning of the year is, that it is now more defined and considerably softer than formerly, which is considered a good indication of its continuing. There is no water to contend with except in the winter months, when there is a good deal of dripping, which makes it very disagreeable to work in the shaft. The Company intend, however, to push the shaft down as far as possible before the winter sets in, so that there will be nothing but stoping to be done in the wet weather. Another vein has been struck in this leasehold lately, which looks well; it was found on the surface about 60 yards north of their present workings; they are about to sink upon it, and should it continue it will materially enhance the value of the property. The Mining Manager complains very much of the scarcity of good miners; he says there has been on the average during the last six months only thirty men employed on the property, whereas the proper complement would be forty-five, with which number nearly double the quantity of work would be done. For this reason the battery has only worked seventy-two days during the last half-year, and 1,200 tons have been put through, from which they received by the ordinary process 600 ozs. of gold; the tailings, however, after they leave the tables pass through one of Munday's buddles, to separate the pyrites, which are afterwards treated in the following manner:—They are first put through the Wheeler's pans (three of which are attached to the battery); this process, however, might be dispensed with, but that the pyrites carry with them from the battery and tables a considerable quantity of quicksilver, which would be lost if they were roasted first; it is therefore with the view of saving this quicksilver that they are first operated upon. During the process, however, a good deal of gold is extracted from them, after which they are roasted in the furnace and again put through the pans. The following is the result of their different operations on pyrites since the first of July:—Ninety tons were put through the pans the first time and 180 ozs. of gold was the result; 42½ tons were roasted and again put through and 83 ozs. were obtained, thus

giving 868 ozs. as the result of this company's operations for the half-year. With their present appliances they cannot treat these pyrites as fast as they accumulate; they have about 500 tons ready for roasting, and 100 tons to put through the pans the first time; the company therefore contemplate building another large furnace, and adding considerably to the one they have, which when first built was meant more for experiment than for actual work.

The Ironclad Company have proved the vein to be good up to the boundary of Mathieson & party's lease. Mathieson & party are sinking, and down about 150 feet; they have a vein in the shaft which shows good gold, but is rather narrow; they do not intend to open out until they reach the depth of 200 feet; they are sanguine of success.

Campbell & party have, during the last three months, been working their lease on the Adelaide Reef; the vein is 6 feet wide, and pretty easily worked; they are about 40 feet down, and have about 70 tons to grass; they are about to crush, and it is the general opinion that the stone will turn out well.

Elder & party are still working their lease on the Victoria Reef; they have not had any crushings during the last six months as they have been engaged sinking a new shaft; there are a great number of small veins in this ground, and some of them contain an amazing quantity of pyrites, which, according to assays, are remarkably rich, there is no doubt, but in this leasehold, or adjacent to it, there is likely to be a rich reef, because rich leaders that have been tried are found in every direction near to it.

There have been no additions during the year to the water resources for mining purposes on Cargo, the present supply being equal to the requirements.

The number of miners on Cargo is about 60 alluvial and 45 quartz, and the entire population 400.

There are two crushing plants on Cargo of an aggregate of 33 horse-power and 25 stamps.

Boney's Rocks and Toogong.

There has been no mining done at either of these places during the year. The crushing plants at Long's Corner have been removed.

Canowindra.

There are three leases and four claims at work in this place, the leases are—

Ryan and Party, Hayes' Reef
Fahy and Party, Blue Jacket Reef
Hill and Party, do.

Charnock and parties claim, Blue Jacket Reef, is the best in the place. They are 250 feet deep, which is the deepest shaft in the place; this reef is 2 feet wide. They have during the year raised and crushed 600 tons, which yielded about 15 dwts. to the ton.

There has been on Canowindra during the twelve months 1,300 tons crushed, which has averaged 15 dwts. to the ton, or 975 ozs., being the product for twelve months of this place.

There is one crushing plant of eight-horse power and six stamps.

There are about twenty miners employed.

The quantity of gold got in the division during the twelve months was, as near as can be ascertained, 3,550 ozs., of which at its value, viz., £8 14s. per oz., would be worth £13,185.

There have been no copper leases at work during the year in the division; there were, however, nine leases applied for of an aggregate area of 500 acres. These areas are situated near Cudell.

There were 108 miners rights, one mineral license, and eight business licenses issued in the division during the year.

LACHLAN DISTRICT.—GREENFELL DIVISION.

(*W. F. Parker, Mining Registrar.*)

THE gold mining interest here is in a very depressed state. There is no doubt a large area of auriferous land, both quartz and alluvial, in the immediate vicinity of Grenfell that would with profit employ some hundreds of men, but there are no miners here to work or

develope the reefs or leads, having nearly all left for Parkes and other places. Speaking of the future, I have no doubt whatever but that a number of the reefs among the list enumerated (some of which were very rich) will be worked and will employ hundreds of men.

A great impetus would be given to the mining interests here should the Consols Gold Mining Company strike a payable reef, and great hopes are entertained that they will do so, the indications being very favourable at the present depth—719 feet. This would cause a number of the well known reefs to be worked and encourage capitalists to invest. It is the want of capital that keeps a number of our best reef claims idle.

The late mining mania appears to have done the Grenfell mining interest a great deal of injury through promoters and brokers deceiving the public. This gold field has been imperfectly prospected, and inefficiently worked. No experienced person for a moment imagines that this gold field is worked out. From 1867 up to 1871 this was the head gold field of New South Wales, and the returns were even good up to the commencement of the mining mania, after which the mining population rapidly left for other rushes. It is impossible that this gold field can be developed without a considerable increase in the mining population. At the Seven-mile there are at present about twenty-two men working, earning from 50s. to 60s. per week each, and I am credibly informed that from two to three hundred men might do the same, as there is a run of ground three or four miles long, known to be auriferous, and scarcely yet touched.

In the immediate vicinity of Grenfell there are plenty of quartz reefs, all idle, that would go from 6 to 10 dwts. to the ton, with no great difficulties to encounter in raising the stone. A little individual success would, I am sure, cause a speedy revival here, and I look forward, at no distant day, to a realization of these hopes.

As will be seen in the returns, there are only 102 men altogether engaged in mining here, and these are not wholly occupied at that, a good many men, for instance, are partly occupied in getting timber for the machinery when working, so that it is impossible for so limited a number of men to produce much gold from their labours.

SCHEDULE.

LIST of auriferous quartz reefs at Grenfell, Emu Creek, and Tyagong Gold Fields.

Lawson's Reef.	Eastern Reef.
White Rose Reef.	Victory Reef.
Golden Point Reef.	O'Brien's No. 1.
Band of Hope Reef.	Do. 2.
Welcome Reef.	Do. 3.
Result Reef.	Oriental Reef.
Lucknow Reef.	Young O'Brien's Reef.
Wilson's Reef.	Preescaei Reef.
Lucknow Small Reef.	Perseverance Reef.
Homeward Bound Reef.	Enterprize.
Dead Man's Reef.	The Who-would-have-thought-it Reef.

LACHLAN DISTRICT.—YOUNG DIVISION.

(J. B. Neate, Mining Registrar.)

THERE are not any distinct alluvial leads being worked within this division at the present time, as the only mining operation now being pursued is that of ground sluicing, where a sufficient supply of water can be obtained, which is a very uncertain mode of mining in a district like this, where there are no continuous streams of water, and the sluices depend entirely upon storm-water, which can only be obtained during the winter months, and even then not to any very great extent.

The area of ground held by these sluicing parties is about 114 acres, of which about 28 acres have been sluiced away during the past quarter, at depths varying from 10 to 30 feet; some of the principal holders of these claims have not as yet washed up since they commenced sluicing at the beginning of the winter.

Several claims which were previously worked by companies in old and deep ground have been abandoned for some time, in consequence of the great difficulty experienced in working the same, on account of drift-sand and the large body of water to be contended with. The absence of sufficient capital to carry on the works in deep ground has also seriously impeded the co-operative miners in their operations. Since the mining "mania" of 1872 and 1873, the community generally are very much disinclined to embark in mining ventures, unless they soon prove of a dividend-paying character, hence a great difficulty is experienced in prosecuting further researches in the abandoned workings within the Burrangong Gold Fields, which are very extensive, and of which I am unable to give even approximately the area.

The only new appliance introduced within this division in connection with gold mining, is that of a party of miners from Adelong, who having obtained an amalgamated claim of 40 acres of old and abandoned alluvial ground, have commenced to cut a tunnel or drainage-race about three quarters of a mile in length, which will effectually drain the ground, and enable them to work it without many of the difficulties which have hitherto retarded, or altogether prevented mining operations on Opossum Flat, and other areas of ground of a similar character. About one-third of the length of the race is completed, and is closely timbered and lathed. There is no doubt, I think, that if these operations prove successful many hundreds of acres of old and abandoned ground in this neighbourhood will eventually be re-worked.

Many quartz reefs have been opened up and prospected, but, with the single exception of the "Marshall M'Mahon" reef, situated within the Cumbamurra Gold Field, which has been abandoned for about two years, they have not proved remunerative; although a large outlay of capital was incurred in sinking shafts, and purchasing and erecting machinery to test them. The same apathy exists amongst capitalists in regard to quartz mining, as that referred to in reference to alluvial workings.

At the present time none of the reefs are being worked, therefore it would be impossible to give any information respecting them.

The quartz reefs not opened are no doubt numerous within this division, but any particulars in regard to them cannot be obtained, so long as they remain in that state.

There are some hundreds of tons of "waste" quartz-tailings within the division, the value of which has not been tested; and I may here remark that the owners of these tailings have failed to supply me with samples of the same for transmission to the department, although they repeatedly promised to do so; in fact they seemed at first quite anxious that the value of the same should be ascertained.

The quantity of gold purchased during the past quarter has been 1,150 oz., and that forwarded by the gold escort during the same period, only 353 ozs.; the apparent difference in the former quantity and that shown in the tabular form herewith, can only be accounted for as follows, namely,—that some of the miners refused to give me the quantity of gold won by them, and I believe a large portion of the gold was held over by the miners from the previous quarter, as they anticipated the abolition of the Gold Duty.

I am not aware of any deposits of minerals other than gold within this division.

SOUTHERN DISTRICT.—BRAIDWOOD DIVISION.

(*W. F. Robertson, Mining Registrar.*)

It will be seen from the accompanying returns that the Braidwood division is at present purely a gold producing one, there being no other description of mining now carried on in the division, and of the gold mining that it is all alluvial and consequently for its successful working dependent entirely upon the supply of water available, and the rain fall for several months having been extremely small, the operations of the miners have been retarded very considerably for the want of a sufficient supply of water to work their claims, so much so that numbers of them have been compelled to abandon their claims for a time and turn their attention to other pursuits or other gold fields, which in such dry seasons can be worked to greater advantage than are these. This may be said to be the principal if not the sole cause for the low state of the mining operations in the division as shown by the returns.

There are in the division numerous works and contrivances for the raising, storing, and diverting the water of the river and creeks by means of dams, reservoirs, and races, constructed at the cost of a great amount of labour and money. Of these the water races are by far the most extensive, the other works mentioned being comparatively of little importance, I shall therefore add some slight description of these races.

The first to be mentioned is the Shoalhaven River Company's race, which is about 25 miles in length, and about 4 feet wide by about 3 feet deep, and carries a fine stream of water from the Shoalhaven River above Warri to the sluicing ground a few miles lower down the river. This race was constructed at a cost of about £4,000 and is now in full working.

The next in order of size is the Warri Company's race, about 20 miles in length, which like the Shoalhaven Co.'s race is capable of carrying a large body of water diverted from the Shoalhaven River to the sluicing ground on the river lower down the stream—this race however has recently discontinued working, the company as I am informed having been dissolved.

There are several smaller races in the division, ranging from 5 miles to 10 or 12 miles in length, and forming a very important part of the mining operations of the division, both in the Shoalhaven River and the Jembaicumbene Gold Fields; but of these I have not been able to gather further information.

In conclusion, I regret that in consequence of my very limited knowledge of the division (having been appointed to it only in September last), I am unable to give a very full and accurate report of the working of its gold fields; and that I am unable to give an estimate of the yield of gold therefrom. The Banks are the principal if not the only buyers of gold in the district, and are the only source from which even an approximate estimate of the yield of gold from the district is derivable, and they keep their accounts of gold purchased in such a manner as does not show from which field the gold is produced, therefore I have had no means whatever of obtaining the information.

SOUTHERN DISTRICT.—ARALUEN DIVISION.

(*E. F. Carlile, Mining Registrar.*)

Alluvial Workings.—These in Araluen extend from the commencement of the creek to its junction with the Deua River, a distance of 10 miles, with a greatly varying width of from a few yards to a quarter of a mile, a great portion of which has been worked a second time. The banks of the Deua River have been mined on at various places by different small parties. The workings at Bell's Paddock, Moreing's Flat, the Middle Lead, and Bell's Creek, are all "old and abandoned," and now yield but a small return, principally to Chinese; the extent of these are:—Bell's Paddock, about 1 mile long and 5 chains wide; Moreing's Flat, same extent; Middle Lead, $\frac{1}{2}$ mile long and 3 chains wide; Bell's Creek, $1\frac{1}{2}$ mile long and from 1 to 3 chains wide. About 4 miles of the Araluen Creek, nearly the whole of Bell's Creek, together with Moreing's Flat, Bell's Paddock, and Middle Lead, are private property. The wash-dirt is principally a sandy vein, mixed with large stones, and easily washed; the thickness of wash varies from a few inches to 8 or 9 feet; the stripping in some places is 25 feet, whilst in others the vein is on the surface; the general run of the stripping in Araluen is from 16 feet to 20 feet. In the run of the creek the underground leakage is heavy, necessitating the employment of steam engines to drain the deep ground. A commencement has been made to bring up large boxed races for drainage purposes, which, when completed, will effect a saving in pumping expenses of from £20 to £30 per week in the large claims, and cause ground to be worked which is now unremunerative. Some of the ground is worked by ground sluicing, where sufficient water can be obtained and the stripping is light; in other places horses and carts are employed for stripping, and in one claim steam-engines and trucks; there is little or no shafting being done.

Quartz.—One reef has been opened and several small veins prospected at Upper Araluen, the reef runs almost due north and south, with a scarcely perceptible dip to the west, in width from 1 to 9 inches; the work done consists of a shaft 125 feet deep, 108 feet of that depth being in granite rock; a tunnel has been driven from the side of the hill, running along the course of the reef a distance of 90 feet, it being intended to strike the shaft at a depth

of 60 feet; a crushing of quartz from the soft granite yielded 1 oz. to the ton; and two crushings from a depth of 80 feet and 60 feet, 4 ozs. and 6½ ozs. respectively; the last crushing (from the tunnel), which showed quite as much gold when being raised as the other two parcels, yielded only 25 dwts., this has induced the proprietors to register the ground for a time for the purpose of getting the stone analysed, as they are under the impression that some mineral of which they have no knowledge has caused the gold to be lost, especially as the gold which was saved in the stamper-boxes was not amalgamated with the quicksilver; about 15 cwt. of stone, showing a large quantity of black mundic, was crushed separately and yielded the same proportion of free gold as the rest of the stone; the mundic tailings were saved. A vein has been sunk on at Apple-Tree Flat, to a depth of 70 feet, in soft granite, about 180 feet in length has been worked; a crushing of surface stone yielded 12 dwts. to the ton; at a depth of from 50 feet to 70 feet the returns were from 17 oz. to 1 oz. 18 dwt.; the vein runs north and south, with very slight dip to the west, and varies in width from 1 to 6 inches; it is on private land, and is now discontinued, the water beginning to get troublesome. Some other veins were prospected on the same property, but little work done. Several micaceous reefs have been prospected, and two or three crushings obtained with no payable results. On the Deua River a tunnel has been driven from the side of a hill, a distance of 343 feet, without cutting any defined reef, merely a jumbled up mass of stone; lower down the hill another tunnel has been driven a distance of 460 feet; in this, at a depth of 400 feet from the crown of the hill, and 25 feet above the river level, the cap of a reef has been struck, which has been cut into for 12 feet, without coming to the opposite wall; the two tunnels are connected by a winze; the vertical distance between them being 100 feet; sufficient work has not been done at the reef to determine its direction or dip. A layer of conglomerate in the reef, on being assayed at the Mint, gave a return of 47 ozs. and 260 ozs. respectively, besides silver, copper, &c.; samples of the quartz assayed at the Mint yielded from 16 grs. to 16 dwts.; a few tons have been crushed on the ground, but I cannot give the result; the work is now at a stand, in consequence of the failure of some of the shareholders. At Bell's Creek the mining is altogether on private property; seventeen distinct veins have been worked to the hard rock, a depth of from 70 feet to 80 feet, in soft granite, and a far larger number prospected, the bearing is east and west, with a slight dip to south; width from 2 inches to 12 inches; the length worked on the different lines is from 300 yards to 900 yards; the average yield has been about 12 dwts. to the ton. I cannot get the returns from the different depths, but some parcels have yielded 4, 5, and 6 ozs. to the ton, and one crushing about 20 ozs.; two shafts have been sunk to a depth of 100 feet each, but no levels or cross-cuts put in; a tunnel was driven from near the bed of the creek for 260 feet in jointy hard granite, and then discontinued; no veins were struck in its course; it was expected that at a distance of 410 feet the Southern Cross vein would have been cut at a depth of 132 feet, and at 517 feet; Brown's vein at a depth of 162 feet; when discontinued the depth was 80 feet. No steady work has been done at this place during the past quarter, most of the veins having been worked out to the level of the hard rock. I cannot get samples of stone from the different depths as requested, most of the shafts having been unworked for some time, and it would be dangerous to descend any which have not already fallen in.

No new methods of treating any of the materials operated on have been introduced recently.

The only "waste" accumulated in this division is a few tons of quartz tailings at one of the machines, and a small quantity of pyrites.

The amount of gold won in this division cannot be ascertained; the Banks (the only gold buyers) decline giving any information. The returns may be obtained from a very few of the claims perhaps; but this, I imagine, would be of no service. The Escort returns from Araluen will not give the correct amount, as one of the Banks does not send its gold by that means.

SOUTHERN DISTRICT.—MAJOR'S CREEK DIVISION.

(*John Heazlett, Mining Registrar.*)

THE Jembaicumbene Swamp is situated some 8 or 4 miles from this creek; and is occupied principally with Chinese—a class from whom but little information can be gathered. This

field is situated for the greater part on the northern or north-eastern bank of the creek, and a portion of it is freehold land, but is nearly deserted, being, it is said, worked out. My opinion is that there is a large quantity of gold still remaining, but cannot be extracted owing to the fact that there is not sufficient fall to work, or, rather, re-work the ground by means of water, of which there is a good supply in the creek in wet seasons. The south-western bank of the creek is supposed to be highly auriferous; the owners—the Messrs. Roberts & Co.—do not seem inclined to allow the miners to enter upon their property in that locality.

The Major's Creek, Long Flat, and the various gullies in the neighbourhood are not yet exhausted, but the contrary; there is room for hundreds of miners provided a supply of water was brought from the Shoalhaven River, which could be done at a cost of (say) from eight to ten thousand pounds sterling. The extra number of miner's rights which would be purchased, besides the increase of gold, or, rather, the duty thereon, would pay good interest on the capital expended, and the miners are strongly of opinion that the Government would be safe in providing the necessary funds to cut a race from Shoalhaven.

There is much surface ground not rich enough to pay puddling-machines, but would pay by means of ground-slucing. Again, there are hundreds of what are termed, in "diggers' parlance," mud leaders, which range from a $\frac{1}{2}$ inch to 1 inch in thickness, but are not rich enough to take out when the charge for crushing small lots is 18s. per ton; therefore, the only way to work such leaders to advantage is by means of water. Again, when the alluvium has been washed off, 'tis probable that many reefs would be laid bare. It may be as well to state that these small leaders are numerous in what the miners term rotten granite, which would wash away quite as speedily as the alluvium would do.

A considerable quantity of water could be brought in from Back Creek in a wet season, and some miners have taken the levels, but have been refused permission by the owners of freehold land between here and the creek, and that, too, notwithstanding an offer of compensation was made.

I may state that on the 30th ultimo, I forwarded to Braidwood, for transmission to Sydney, a bag containing a few samples from reefs or veins now being worked, and two samples taken from reefs unopened, all of which are ticketed and numbered, so that you can see from what locality each sample has been taken. I have not obtained samples in triplicate, for the reason that I could not get them; therefore was obliged to take such as I could obtain from the miners. I have not procured any samples from the old workings, nor do I see how I can, as to even try it I must have the assistance of a man, together with rope, buckets, pick, shovel, and windlass; and to give a man £2 5s. per week out of £3 10s. a week—"my pay"—I do not understand how to manage it. I believe I could obtain samples from undeveloped and undiscovered reefs, had I the assistance of a man and horse with pack-saddle or even saddle-bags to carry home the samples when found.

To give an accurate account of the number of miners in my division I should spend the greater portion of the quarter travelling through the division to find all, and the Chinese are not easily counted, being like a flock of sheep—"all of a sameness." Could all the miners in my division be made to purchase the miner's right from me I would have a better knowledge as to both names and numbers.

I find it impossible to give a correct estimate of the quantity of gold won in my division. Some parcels go direct to the Mint—some sold to the Banks at Braidwood and Araluen. It is said the Chinese do not sell all their gold; some parcels come to this creek from outside my division. The miners keep no books, and when they have settled up with their mates the tickets received from the gold-buyers are no more thought of. The storekeepers don't like the trouble to overhaul their books quarterly; indeed, one of them told me he keeps no books, but that I might set down his purchases at 5 ozs. per week.

To give the number of square miles of auriferous ground which is being or may have been actually worked upon is more than I can do. As yet I have not had any plan showing the extent and boundary of my division, and even if I had such plan how could I tell the number of miles which is auriferous ground? This would be the work of a surveyor, and to give the extent of each alluvial lead or deposit opened and now being worked is the work of a surveyor also. "Deep leads" there are none in my division; and the reason why ground has

been abandoned is that it would not pay for working, or that it had been worked out, as the case may have been.

The tailings and refuse from crushing-mills have been discharged into the creek, from whence they are driven away by the floods and freshes from time to time.

Refuse from puddling-machines can be had in large quantities. The sludge is considered valueless; not so with the tailings, which would pay for ground-sluicing if water enough to do so.

There are no minerals other than gold in my division. Some of the mines are said to contain cobalt, nickel, &c., &c., but as yet we have nothing more than reports; the stone must be manipulated ere we can give any definite account. I may state that the two samples numbered 1 and 2, which I have forwarded, will show you all about those minerals said to be in the claim.

The reefs and leaders already opened at this place have been worked to the mundic in some places—others have been worked to the water—so that as yet it may be termed surfacing, the shallowest being 10 feet to the hard or solid rock, and the deepest about 90 feet to the solid rock where the mundic makes its appearance. Many of the leaders already worked would not have paid were it not that the country driven through was soft or what is termed decomposed granite, which is easily driven through. Before reaching the hard rock those leaders are taken out on the foot and not the hanging-wall side, or, in other words, what is termed the hanging-wall in hard country is termed the foot-wall in the soft granite. When working through solid rock this method is abandoned. The reefs point east and west, or nearly so, which appears to be the reverse of what is found in slate country.

SOUTHERN DISTRICT.—LITTLE RIVER DIVISION.

(*P. J. Galway, Mining Registrar.*)

THIS division extends from the coast range near Mongo to the junction of the Mongarlowe or Little River with the Shoalhaven, about 25 miles in length.

When first proclaimed the gold field included the entire watershed of the river. In 1865 by proclamation the limits were much reduced, being curtailed to one half mile ($\frac{1}{2}$) on each side of the Mongarlowe, this reduction of the limits was a great mistake, large portions of auriferous land thus left open were at once taken up by conditional purchase, and the obstruction thus put to prospecting, cutting races, etc., has tended very much to retard the proper development of this division. I have no doubt that if the old limits were again proclaimed a great step would be taken towards reviving this gold field.

I would also bring under the notice of the department the necessity of some enactment by which miners could bring water through private ground for mining purposes.

The gold in this division lies in patches, scattered over a large area, the depth not exceeding 25 feet, and with the exception of the river bed, Fagan's, Bob's, Nettleton, Warrambucca, and Sergeant's Creeks, nothing like a continuous lead of gold has been worked.

There are numerous hills called Surface Hills, with gold from the grass roots to the rock, the depth of soil being from 6 inches to 6 feet, it is here that ground sluicing is employed.

The gold in this division is generally coarse, nuggets up to 360 ozs. having been found, from Nettleton's Creek to the junction of the Shoalhaven, the gold is very fine on the hills, but in the river bed is of the same kind as higher up the river.

The bed rock is slate with bands of sandstone and quartz leaders, showing the colour of gold in many places.

The slate formation is about 5 miles wide, and on the western side of the river joins the granite formation of the Bell's Creek and Shoalhaven gold fields.

On the eastern side, running parallel with the Buddawang or coast range, is a belt of basalt rock about 72 miles wide, this rock is similar to that found in the deep sinking on some of our best gold fields. Several experienced miners are of opinion that this rock overlies an old river bed, and it is the intention of some parties here to form a prospecting party to test the matter.

The very dry winter just passed has been a great drawback to this field, as the chief mode of gold mining is ground sluicing, and very many of the miners had to look for employment on the roads and railway until sufficient rain falls to set the races again at work.

From the returns respecting quartz reefs, the department will perceive that this division presents the most favourable in the Colony for the investment of capital in that branch of mining, and if in any other part of the Colony, instead of a lot of deserted shafts, a hive of industry would be seen.

From forty different reefs payable gold was obtained, but water being generally found at the depth of 40 feet, and pumping engines being too expensive for the individual miners, quartz mining here has been abandoned.

An effort is now made to revive it, and a trial crushing of 10 tons has been sent to Bell's Creek, the result of which will be made known to the department.

Samples of quartz where procurable are ready, and will be forwarded by first opportunity.

Strong copper indications are found from the coast range at Monga to the Shoalhaven River.

Several mineral leases were taken up, but again abandoned in the late general collapse of mining.

SOUTHERN DISTRICT.—NEERIGUNDAH DIVISION.

(*W. J. Foster, Mining Registrar.*)

1st. In this division there are no alluvial leads in the sense in which the term "lead" is used or applied in this and other Colonies to alluvial deposits. The gold-bearing country is confined to the creeks and the points jutting into them. The general roughness of the whole district indicates to the practical miner that search for gold beyond the creeks and points would be useless.

No new ground is being opened, nor has there been during the last eight years.

The present workings are confined to ground which has in former years been occupied to mine upon, worked more or less, and then abandoned; and the whole district as occupied at present may truly be called abandoned workings.

The deposit in the Gulph Creek commences at the surface, with a loam from 6 to 18 inches in thickness, resting upon three successive layers of drift-sand and fine gravel, these laying upon a stratum of boulder-wash of quartz, sandstone, and slate, sometimes intermixed with clay at the bottom on the bed rock.

In the other creeks the loam lays upon a stiff clay that rests upon a heavy boulder-wash generally intermixed with a stiff clay on the bed rock. The depth ranges from 2 to 30 feet. The mode of working the creeks for years past is to strip off the top drift to the wash dirt at the bottom, either with wheelbarrows or horses and carts, and sluice the gold-bearing dirt in boxes. The points are ground sluiced by water diverted from the creeks by races sufficiently high to command the ground to be worked.

It is now impossible to give even an approximate return of the yields obtained when first worked.

2nd. There are six quartz reefs or veins, with more or less work done on them in the way of opening, viz. :—

Bailey's line, Graveyard Creek.—Two men employed; shaft sunk, 40 feet; 200 feet along the line worked, by 10, 20, and 40 feet deep at different places; average yield per ton, 7 dwts.; bearing north 16° east; dip, $2\frac{1}{2}^{\circ}$; width, 8 feet; east or hanging wall, sandstone; west wall, slate.

Nutley's Line, Graveyard Creek.—Shaft sunk 43 feet; no properly defined reef discovered; average yield per ton, 5 dwts; water encountered at 20 feet deep; work now and for some months past suspended on account of the water.

Pollock's Reef, North's Creek.—Shaft, 100 feet deep; trial crushing at local machine yielded 4 dwts. per ton, from stone taken at the depth of 50 feet from the bottom, the stone produced nil; reef, 3 feet thick, well defined, with walls of slate and sandstone; bearing east about 20° south; dip, about $2\frac{1}{2}^{\circ}$; no labour employed, nor has there been for years, save getting out stone for a trial crushing.

This is a cross reef, as there is another reef running north and south, or nearly so, cutting it at right angles, upon which there is a shaft down 90 feet; and a trial crushing of stone from the bottom, made at the Mint, yielded 7 dwts. I have not been able to get further particulars of this second reef; no labour employed, nor for years past, except to get out a trial crushing.

Tucker Hill, North's Creek.—No shaft; and no labour employed; reef found in sinking for alluvial gold; proved to be 12 feet wide, with sandstone wall on the east, and slate on the west; bearing north about 15° east; not opened sufficiently to say what the dip is; a trial at the Mint of stone taken from the west side yielded 2½ dwts. per ton.

Old Australian line of reef, Upper Gulph Creek (Stack's Prospecting Claim).—No labour employed, nor for many months past; two shafts, the first near the creek down 30 feet, the second down 43 feet—both upon a strong flow of water—work suspended on that account; no defined reef; two trials of rubble-stone from No. 1 shaft yielded 16 dwts. per ton.

Young Australian line of reef, Bumbo.—I have not been able to obtain any information in regard to this reef; work has been suspended about six weeks, and the shareholders away. I may be able to give particulars in my next report.

3rd. There is no waste accumulated upon this gold field; the tailings from the different workings are discharged into the creeks, and swept away by the floods.

4th. About eight years ago a mineral was found in a claim then in work in the Gulph Creek, on the alienated land of Mr. H. O. T. Cowdroy; and in the same year, in another claim, outside the private land, down the creek, a similar mineral in appearance was also found. There was no one here that could tell what mineral it was. A small sample was sent to the Honorable Saul Samuel for analysis by Mr. Cowdroy, the return was that it contained silver, but in what proportion was not stated. The mineral is below the water-line, and found in a belt of granite that runs nearly north and south—the direction of the Gulph Creek, and traverses the granite east and west. In the first claim it showed in form like an elliptic, about 1 foot wide in its broadest place, tapering down for about 4 feet towards the ends until a fine mark only was visible. I am unable to state under what circumstances it showed in the second claim, as there is no one here now that worked the ground. Payable gold was found in both claims in connection with the mineral. I send you three small samples taken from the second claim, the only ones obtainable at present.

5th. In reference to samples of stone from the reefs, none of them being in work save Bailey's, I have not been able to obtain any as yet. Bailey has promised me samples from his reef, and I hope to be able to obtain others from all or some of the other reefs named; so soon as I do I shall forward them to your Department.

6th. As no new alluvial ground has been discovered in this division, and the labour of the miners is confined to the old workings, they must sooner or later become exhausted, and the population has diminished year after year as the yield of gold fell off, until it has reached its present minimum.

It was hoped about two years since—and the prospects upon the discovery of some of the reefs gave promise that those hopes would be realized—that this division would prove to be a rich quartz-reefing district; but the trials that have been made dissipated those expectations for the present, although there are some that have great confidence,—that if the reefs are ever fairly tested below the water line that quartz-mining in this district will yet develop into a large and remunerative industry.

Mining Registrar's Office,
Nerrigundah, 25 October, 1875.

Sir,

Since posting my September quarterly report for this division, Mr. Warden De Boos has been here, and suggested that I should give you the data upon which I arrive at the area of 8½ square miles of auriferous ground, which is being, or may have been, actually worked upon in this district.

						square miles.
I have, therefore, the honor to acquaint you, that I allow for the Gulph Creek,						
12 miles in length by 200 yards in width, $1\frac{1}{4}$ square miles	...	...	...	...	...	$1\frac{1}{4}$
Bullock Creek 1, Captain's Creek 1, Deep Creek 4, Sawpit Gully Creek 1,						
Grave Yard Creek 2, North's Creek 3, Bumbo Creek 6, Quart-pot Creek 1,						
Tin-pot Creek 1, Cut-burrough Creek 2 = 22 miles						
In length by 100 yards wide, $1\frac{1}{4}$ square miles	...	...	...	...	...	$1\frac{1}{4}$
Dromedary Creek 3, Randler's Creek 2, Burrumbidgee Creek 1, Small creeks						
and gullies 6 = 12 miles						
In length by 50 yards wide, $\frac{1}{4}$ square miles	...	...	...	...	...	$\frac{1}{4}$
						<hr/>
						$3\frac{1}{4}$

I find upon looking over my work that the area for the Gulph Creek, and the first bunch of creeks is too high; the Gulph Creek is about $1\frac{1}{2}$ miles, and the first bunch $1\frac{1}{2}$ miles, making together $2\frac{1}{2}$ miles, or for the whole area, approximately 3 square miles.

I have, &c.,
 The Under Secretary for Mines, Sydney. W. J. FOSTER,
Mining Registrar.

SOUTHERN DISTRICT.—SHOALHAVEN DIVISION.

(*W. Lovegrove, Mining Registrar.*)

Mining for metals, except gold, is at a standstill.

The gold leases at Yalwal having been at length surveyed, several shafts have been put down, and a list of them will be found, which comprehends all the work on the ground except three cross-cuts on the hillside, from all of which, I understand the stone proved auriferous; but opinion is divided as to the strike of the ground, and the probability is more or less of a "blow" character. The surface, where it shows in some places as a cliff, gives a dip nearly vertical, but easterly, whereas in No. 2, the shaft goes down alongside of the reef for 20 feet, and it seems inclined, if anything, westerly.

The samples sent are from No. 1. (Schafer's) and No. 2.

It is impossible to gather the quantity crushed, as the *pestle* and *mortar* alluded to in "machinery" is the principal crusher, the Beer's Battery being constantly out of order. The whole proceedings betray utter want of capital, and this is felt by the miners themselves, but the fact that they have stayed on the ground for three years, and made good wages, is sufficient proof that the gold is there. The workings are about 150 feet above, and nearly overhanging the Dangera Creek, and the general trend of the country and creek is about N. 30° E.

In the leased claims at Dangera No. 1 (Mr. L. S. Dale's number.)—The party are increasing their paddock, waiting for machinery.

No. 2 has sunk to 41 feet, and driven westwards, cutting the quartz, and showing 6 to 12-oz. stone.

No. 7 has sunk 67 feet, and driven to find the reef, have cut two small veins,—no gold. The machinery and water-wheel progress slowly.

No other noticeable work has been done except a cross-cut in Coleson's lease (not yet surveyed); gold shows on the surface, and the general opinion is that it is on Schafer's line, but I do not consider it certain.

Coal.

The whole northern water-shed of the district shows seams of coal, which lie from 1,100 to 1,200 feet above sea-level in the Saddleback and Cambewarra Ranges. The cleavages are vertical and horizontal within a degree or two.

Samples are sent from the most easterly and most westerly outcrops, but as no real work is done, they consist mostly of perished coal, and in one case taken from the bed of the creek which has laid it open.

I also saw some good kerosene shale, a water-worn slab, chips of which ignited readily with a match and burnt clearly.

The site is probably near the coal.

The sandstone overlying the coal is micaceous; lignite is abundant, and fossil-leaves in clay shale. The depth of the most eastern seam appeared to be as follows:—

Coal with small clay bands	...	...	...	...	...	6 feet.
Sandstone	...	...	...	...	...	2 "
Coal	...	...	...	...	...	8 "

but the foot of the lower coal is not visible. This is on Messrs. Parkes and Sutherland's lease, parish of Wallaya. No. 60, M.L.

About 2 miles S.W. on Broughton's Head, is the outcrop of Messrs. Wilson and Stewart's coal, and the seam is again divided by about 2 feet of sandstone. This is a mineral freehold, and from it issues the creek in which the kerosene shale was found. The strike of the range and of the outcrops for 12 miles, is from N.E. to S.W., and for that distance the coal is under a sandstone cliff of considerable height. There is no range intervening between the seams and Jervis Bay, which will be the place of shipment; distance from 12 to 30 miles. The coal seems to deteriorate and run out further west.

Tin.

Tin ore has been picked up by the Rev. W. B. Clarke in the Shoalhaven, but no lode has been found, I look upon the two leases lately taken up for tin at Comarong Island, as mere nonsense.

General.

I take this opportunity of sending samples of surface copper, the owner of which wishes to know their probable value, also, of an ore (blank label) supposed to be iron, on which the same information is requested.

SOUTHERN DISTRICT.—NERRIMUNGAH DIVISION.

(*Albert Fox, Mining Registrar.*)

General Remarks.

CONCERNING the alluvial workings in this division, commencing with the Shoalhaven River, the length, to follow the windings of this river in this division, is, as near as I can ascertain, about 50 miles.

No regular lead, gold deposits at intervals in the various points or bends of the river.

General character of deposit, gravel and boulders.

Average depth, 4 or 5 feet. Mode of working, sluicing and cradling. This river has been worked for many years with average success, but at the present time all but worked out and abandoned.

The number of men at present employed on it I have been unable to ascertain owing to the large area and scattered workings.

To show the scattered nature of the workings in this division I will start with the surface claims.

To the east of this office, distant about 2 miles, is the Rocky Creek; extent that has been worked, about 5 miles; now worked out and abandoned, with the exception of one man fossicking. To the south of this office, distant about 2 miles, is the Spa Creek, at present two men working; mode of working, ground sluicing; depth, about 12 feet; no regular lead; description of deposit, clay and gravel. South of this office about 5 miles is the Black Springs, surface claim; area opened, about 1 mile; now being worked by two Chinamen; mode of working ground, sluicing; character of deposit, pipe clay and gravel; depth, about 15 feet; no defined lead. West of the Black Springs, about 6 miles from this office, is Broken Creek, worked out and abandoned; at present one man fossicking. Character of deposit, gravel wash. South of this office, distant 12 miles, is the Yellow Springs; area that has been opened and now abandoned, about 5 square miles; at the present time three miners employed there ground sluicing. Character of deposit, cement and gravel; depth about 20 feet. About 4 miles in a

south-west direction from Yellow Springs is Fernbank. Alluvial gold has been got in several gullies round about Fernbank, which are now worked out and abandoned. A few parties are working in the Shoalhaven River, which runs close by Fernbank.

Several reefs have been opened in the vicinity of Yellow Springs and Fernbank, but all are now abandoned.

In respect to the quartz reefs in this division, the reefs or leaders that have been opened number about 100, which are now all abandoned with the exception of Adams' 5 acre lease, at Manton's Reef, which has lately been taken up again, although not at present worked. No defined reef has been found in the whole of this division, only blows and leaders, which generally pinch out at a depth of from 20 to 30 feet. The greatest depth has been reached in the prospector's reef, viz., 300 feet. The average depth of the remainder is about 100 feet. The majority of the abandoned reefs were gold bearing at the surface, but carried the gold no distance down.

Concerning the reefs not opened, there are several veins, or rather blows from reefs cropping above the surface in this division. Many of these outcrops do not go more than 2 or 3 feet below the surface, and the quartz is coarse or hungry looking, not calculated to carry gold from the appearance. (Samples forwarded.)

In respect to the quantity of "waste" accumulated on this gold field, there are about 600 tons of tailings at the quartz crushing battery at Manton's Reef. From all the other workings in this division the "waste" has not been allowed to accumulate, but has been sent down the creeks into the Shoalhaven River.

With the exception of copper there is no sign of any minerals other than gold.

In this division several mineral leases have been taken up, only two of which have been worked, viz., the Appleton Copper Company and the Jacqua Company. No lode was struck in the former. I have collected samples of the lode that was got in the Jacqua Copper Mine. These samples are from a drive that was put in the side of a range about 200 feet below the surface. Length of drive, 60 feet. Each of these mineral leases have been abandoned more than two years.

SOUTHERN DISTRICT.—GUNNING DIVISION.

(*Edmund B. Raynor, Mining Registrar.*)

I HAVE visited the mines on several different occasions; on the first I found that no crushing had been done for this year, and none at present. Those who hold leases would not work because there had been no survey; and although there is good gold thereabouts the miners are confined to a very small area, on account of the field not being proclaimed. A settler has taken advantage of this, and enclosed the miners within a fence, and charges them £2 per annum agistment for a single horse, so that they have left in disgust, stating that the best portions of the gold-bearing ground is on this man's lease, and they have no chance, but that the gold is undoubtedly there.

On my last visit since the receipt of your last letter, I found that the proprietor of the 15 head steam-crushing machine is driving; that two others are sinking deep, but not yet crushing. All complaining that the great drawback to their labours and success is, that the field is not proclaimed. I stated all this to Mr. De Boos, the Warden, who was with me a week or two ago, and he took a note of it.

When I visited the mines, at Jerrawa, I found everything at a standstill; no one to give me any information. The miners had not been at work since Christmas. Within the last few days I again visited them, when I found the son of the proprietor of the crushing-machine there (he is also proprietor of the 10-acre claim); from him I learned that they crushed (trial) about three tons, which gave 6 dwts. per ton; but that they intended to sink deeper, as the prospects increased in value. He produced the piece of gold from the crushing, which was exceedingly pale in colour. He informed me that the next claim was about 120 feet deep, but had not crushed, and had left off work until they (the proprietors of the 10-acre claim) had made another trial crushing; the third claim holder had abandoned his for want of funds. He spoke very favourably of the ground around, but said that no good could accrue unless there was some protection to the miners, as the Selector Roofs had so completely

hemmed them in with leased land, that the miners were driven from prospecting further; that he charged such agistment for their horse or horses, that it was a drawback on their labour; that in fact the mines would have to be abandoned on that account; no one after looking round would stay; that the best prospects were on his leaseholds, and that every impediment was thrown in the way, as this man had a *down* (that is the word) on all gold-miners; still he felt convinced that the ground though not rich would pay if a number of miners were established there, and a fair trial of the surrounding ground given.

As to the copper, the mine at Currawong fluctuates, as it always has done; it has lately passed into the hands of persons who are very cautious in their proceedings. In fact, as they have not yet got into working order, no estimate can be given; they are sinking shafts in several places, and merely smelting at this present time sufficient ore to pay expenses; still they are very sanguine of ultimate success. For a long distance strong indications of copper are to be found, and as far as my judgment goes, knowing somewhat of the Cornish mines, I have no doubt (nor has any one besides who has been at Currawong) that somewhere about, there is a very rich lode of copper, but this has to be found; although wherever they sink and drive, payable copper is always to be got. It is the general belief of all those who have had to do with copper-mines, both here and in England, that the lode will be eventually discovered, and that the mines at Currawong will turn out a rich venture; they have been at work now 10 years, and have every appliance—furnaces for smelting, steam engine, &c., &c.

I have little to say of the copper mines close to the Railway, at Gunning. From indications in every direction the Cornish miners who have visited the spot all declare that there can be no doubt that one of the very richest lodes is yet to be struck in the locality. Three shafts in different directions, have been sunk to the depth from 100 to 150 feet, every one containing evidence of copper. As they went down the indications gradually improved; but as the company was formed by small tradesmen and working-men at Gunning, the pressure for money to carry out their intentions became too heavy, and the speculation was finally abandoned. It is thought the proximity to the railway station would be of great advantage to a company desiring to forward the ore to smelting works, and that consequently capitalists may with every prospect of success give these mines another trial.

TUMUT AND ADELONG DISTRICT.—ADELONG DIVISION.

(*Wm. J. Shelley, Mining Registrar.*)

THE general appearance of the quartz mines in Adelong is very good, and within three months much larger returns will be obtained than have been for some time. The only drawback being the hardness of the country and the depth to which some of the mines have reached. The extent of the alluvial lead at Shepard's Town, on the Adelong Creek (as far as it has been worked), is about 2 miles, the average width being about 60 feet, the number of men employed are ninety-six. The remainder of the miners employed at alluvial mining are distributed throughout the district viz., on small creeks; the general depth being from 2 feet to 50. The mode of working in the shallow ground being sluicing or stripping, and in the deep ground it is blocked out.

The approximate area of abandoned alluvial ground is about 100 acres (this does not refer to ground worked out); the cause for abandonment was because it was too expensive to work having to contend with so much water, and the lead patchy.

The number of quartz veins in my district opened and unopened are thirteen. The number of miners employed on those opened are Victoria Line 159, Caledonia 8, Donkey Hill 7, Gibraltar 4, Old Hill 18.

The length on the lines are—Victoria $1\frac{1}{2}$ mile, Gibraltar $\frac{1}{2}$ mile, Donkey Hill $\frac{1}{2}$ mile, Caledonia $\frac{1}{2}$ mile, Old Hill $\frac{1}{2}$ mile, the deepest claim on the Victoria Line is 620 feet. Gibraltar 200, Donkey Hill 270, Caledonia 200, and Old Hill 500.

This all the information I have as yet been able to obtain. I cannot obtain samples of the stone in triplicate from each claim as requested, but I have no doubt that in time I will be able to overcome all difficulties.

The mode of treating the quartz is, viz., first passed through the battery and then through the Chilian mills, the waste is allowed to go into the creek.

It is impossible for me to give an accurate return of all gold won in this division, as many of the alluvial miners left here two months since, and therefore I could not obtain the exact amount, and the Banks do not keep a separate account of the gold purchased from the several localities, and then there is an uncertain allowance to make for other districts such as Tumbarumba, Reedy Flat, and Upper Adelong.

Alluvial.

Since my last report there have not been any new leads opened except A. D. Shepard's lease, and that can hardly be termed a fresh one, it only being about 150 feet from the old one and in the same claim. Many of the claims at Shepard's Town are worked out, but there is one party going to try some of the unworked leases again. The number of men employed at Shepard's Town are fifty-nine. Sharp's Creek leads are in the bed of the creek, and about 25 feet deep, the whole width of the creek, there are also many bank sluicing dams, the number of men employed being 20.

Nacka Nacka Creek mining is all bank sluicing claims from 2 to 15 feet deep; there are at present only five men employed thereon.

Adelong Creek includes all "stragglers"; some are sluicing in the bed of the creek, and some on the banks; there are about twenty-seven men at work, including Chinese; the average depth being 5 feet. With reference to the abandoned ground there could be 30 acres added to my last report; the cause for abandonment being on account of some of the ground being worked out, and some being too deep and wet to pay.

Quartz.

The number of quartz veins opened in my district are eleven, viz. :—

Victoria, 159 men; length worked, 1½ mile; depth, 640 feet; width of reef, 1 foot.

Middle Reef, 190 feet; lode patchy; no work at present carried on; 1½ mile long.

Wadalga just opened.

Old Hill Line; eighteen men; depth, 500 feet; width of reef, 18 inches; opened 1 mile long.

Curragong, twenty-nine men; depth, 200 feet; 4 feet reef; opened ¼-mile long.

Donkey Hill, 300 feet deep; seven men; 6 inches reef.

Fletcher's Reef, three men; 195 feet; no stone on claim.

Gibraltar, four men; ¼ mile; just opened.

Shepard's Town, just opened.

Abandoned.

Camp Reef; no stone in the bottom; down 190 feet.

Gap Reef, no stone in the bottom; down to 60 feet.

In mentioning the length of reefs now worked upon, there are idle claims between, but all have at some time been worked, and most are now unworked, because the shareholders are not compelled to do so under the old regulations until the lease is issued, and therefore the ground cannot be touched.

TUMUT AND ADELONG DISTRICT.—TUMUT DIVISION.

(H. Hilton, Mining Registrar.)

THE few miners at Sandy Creek and locality have no systematic way of working; they are scattered over a very large area of country working in twos and threes, and in some cases alone, and making a very scanty existence. The whole of the country has auriferous indications, but requires capital and proper machinery to develop it.

My office as Mining Registrar is all but a myth. I do not see a miner once a month, and my fees do not cover my postal expenses.

TUMUT AND ADELONG DISTRICT.—KIANDRA DIVISION.

(S. P. B. *Kentish, Mining Registrar.*)

THE auriferous dirt is obtained by tunnelling, but this latter operation is at present being carried on only at the claim of the Emperor Company on New Chum Hill. The works undertaken by this company, which are on a very extensive scale, and have been prosecuted with much energy, and in a thoroughly systematic manner, are now completed for the commencement of crushing operations, which will be started early next month. This undertaking, which is the only event of importance in the mining history of this division, since the discovery of payable quartz reefs years ago gave an impetus to mining, which however was of short duration, and a promise of a revival of prosperity which was not fulfilled, is being watched with much interest and anxiety. On its success or failure depends the future of Kiandra, whether it shall become one of the most important and permanently flourishing gold fields in New South Wales or dwindle to extinction in a few years. The works of the Emperor Company are on a hill on the north side of Bullock Head Creek, and about a mile north of the town. These consist of a 30 horse power engine, crushing machinery of twenty stampers, with all the necessary plant, and a tunnel 6 feet in the clear in height and width, carried in through the rock 550 feet. At that distance a shaft is driven upwards about 20 feet to the level of the wash dirt, and drives are opened ready for the employment of as many men as will be required to supply the batteries with material for crushing. The value of the whole plant is £7,000. The thickness of the stratum of gold bearing gravel of course varies considerably, but it is supposed the whole height of the drives will be generally payable. The prospects obtained from a trial crushing of 80 tons, taken from various parts of the old workings on the hill, were in excess of the estimate of what would be necessary to yield a paying dividend, and were considered so far satisfactory as to justify the prosecution of the works, which were immediately afterwards commenced. There is every reason to believe the bed of gravel to be operated on is of vast extent. A tunnel carried into the hill 100 yards from the present one, to a distance of 1,000 feet, showed similar gravel existing at that distance into the hill, as was the case also in another tunnel 300 or 400 yards to the westward, which was taken in 1,200 feet. The hill which rises rapidly from the mouth of the tunnel to a height of 400 feet above the level of the rock on which lies the gold bearing gravel, extends over a mile to the north, and with an average width east and west of more than $\frac{1}{2}$ a mile. The top is a table land thickly strewn with large basalt stones, with here and there the same rock in solid masses. The same formation obtains throughout the large extent of table land extending southerly from Bullock Head Creek, the valley of which separates it from that of New Chum Hill, to the Nine Mile, and from the valley of the Eucumbene easterly to that of the Tumut on the west. The same sort of wash dirt underlying similar strata of drift, lignite, pipeclay, &c., with basalt on the surface is found at Nine Mile, as also at Four Mile in the same line, as well as that part of the hill close to the town. It is therefore reasonable to suppose it may be found in many intervening places where the contour of the slopes may afford facilities for tunnelling. Consequently, if the Emperor Company's speculation should turn out as expected, it is tolerably certain many similar ones will be entered into in a short time.

Nearly all the mining done on this gold field is surfacing. The depth of the ground seldom exceeds 6 feet, and probably does not average 4 feet. The bed rock is generally a soft yellowish rock of a slaty structure.

The quantity of gold produced in this quarter is no measure of the annual yield. The majority of the ground sluicing claims wash up only once a year, generally about November. The amount of gold for next quarter will therefore exceed that for the present quarter very considerably, probably by 5 or 6 times.

Quartz mining, though not altogether abandoned, inasmuch as some claims are still kept possession of, is entirely discontinued. No work has been attempted for the last three years on any of the reefs. Want of means to procure machinery is the principal cause why this class of mining has been neglected. There are five reefs known to be auriferous, and all within a short distance of the town, but on none of them has any work been done worth mentioning.

The Three-mile Reef is the one from which the most promising results have been obtained. About 200 tons of stone were crushed from this reef, giving an average of 19 dwts. to the ton, but for want of machinery on the spot this was insufficient to pay, and nothing has been done on it for the last five years.

About 60 yards to the east of this reef a very rich lead was struck, from which gold to the value of £1,000 was taken by four men in a few weeks. The attempt to trace it down was abandoned from the difficulty and expense of beating the water. The deepest shaft sunk on any reef on Kiandra was on this leader, but that was under 60 feet.

The Charcoal Reef produced some very good stone, averaging 3 ozs. to the ton, but from the small body of stone and the expense of getting it, owing to the quantity of water, work was given up. On this reef a shaft was sunk over 50 feet.

On none of the other reefs has any shaft been put down over 20 feet, consequently nothing is known of them beyond the fact of gold being got in the stone at the surface.

TUMUT AND ADELONG DISTRICT.—TUMBARUMBA DIVISION.

(*H. M. Langford, Mining Registrar.*)

THE mining mania which set in here in 1872 and 1873 was followed by a reaction, from which this district has not yet recovered. A few companies, however, survived the wreck—the Burra Gold and Tin Mining Co. and the Manus Creek Gold Sluicing Co., both Victorian companies. The escort from here last month took down from the former 282 ozs. for two months' work, and from the latter there are yet no results, as sluicing operations have only recently commenced; on this claim a sum of over £5,000 has been already expended in blasting up a tail-race, which is not yet quite finished. The Surface Hill Gold Mining Company, Upper Tumbarumba, is now being worked by the original and resident shareholders on their own account, the holders of scrip having failed to pay up.

A plant of 30 tons of machinery arrived at the Pilot Reef, Merangle, within 5 miles of the Upper Tumut River, during the winter, and will soon be at work in bailing out and putting down a main shaft. A similar plant for the Paddy's River Reef is being erected by Victorian speculators.

Since the mountain roads have acquired sufficient hardness, the Victorian company owning the Nevada Reef, Paddy's River, have succeeded in placing their mining plant on the ground; ten men are now making preparations for its erection, whilst three are sinking a shaft. A new reef, bearing gold, running parallel to the present one, has been struck lately; dip, N.W. direction, 10 degrees north of east; width of lode, about 2 feet. The shaft has been sunk 25 feet, when water was struck, and is still being prospected. A new company is just starting a tail-race and extensive works at the Upper Burra, with every prospect of success. Two companies (N.N. Gitchell & Co.) have invested from seven to eight thousand pounds bringing in extensive tail-races, which are giving good returns to the shareholders and employment to thirty or forty men. I have no means of obtaining correctly the yield of gold from alluviums, but I am satisfied that the average earnings of the miners will compare favourably with other districts; wages from 40s. to 60s. per week.

The returns from individual miners are very small at present.

You will observe from my filled-in printed forms that the deepest shaft in this division is at Ournie, from which district I hope to procure full particulars to include in my next quarterly report.

TUMUT AND ADELONG DISTRICT.—YASS DIVISION.

(*L. Yates, Mining Registrar.*)

1. The number of quartz reefs opened or unopened.—The reefs unopened in this district are very numerous; in respect to those that have been opened ten miners only are employed on the Caledonian Reef, and of this reef I can furnish no further particulars than those contained in annexed forms.

2. Particulars of abandoned reefs.—Several reefs were opened at Nanama, about 18 miles from Yass, to a depth varying from 120 feet to 60 feet; the width was generally from 3 feet to 6 feet; the strike a few degrees W. of N.; and the yield was never ascertained.

3. Particulars of reefs unopened.—I am unable to supply in this report. In my next I trust to be able to give more information.

4. Particulars respecting minerals other than gold.—Rich copper ore has been obtained from the Good Hope Mine, distant from Yass about 14 miles. For full particulars I beg to refer you to Messrs. Morehead & Young, of Sydney, the Managers for the Company owning the mine. Lead has been worked on the Yass River, opposite to the Good Hope Mine, at Woolgarlow. The working of this mine was abandoned after the machinery erected for smelting the ore had been carried away by the flood in 1870. A lead mine was also opened at Limestone Creek, about 6 miles from Yass; twenty years ago it was worked only for a short time; result not known. There are numerous iron and manganese reefs in this district.

I hope to be in a position to supply fuller information in my next Report, and accompany it with numerous samples of the ores of the district.

TUMUT AND ADELONG DISTRICT.—TEN-MILE CREEK DIVISION.

(*P. Brislan, Mining Registrar.*)

THE quartz reefs in this division do not seem to be progressing with favourable results, the reefs being nearly all taken up as leases and the leaseholders not caring to employ labour to work them; the yield of gold in the reefs varies very much—from $4\frac{1}{2}$ ozs. to 5 dwts. to the ton; great hopes are entertained that when new machinery that is about to be brought on the diggings arrives, and when the leases are all granted an influx of people may be expected.

PEEL AND URALLA DISTRICT.—NUNDLE DIVISION.

(*Samuel Kermode, Mining Registrar.*)

IN the first place, I cannot do better than report upon the Cement Lead at Mount Misery. As far as tested the Cement itself appears to lie beneath a basaltic rock of various thicknesses in different leases, and to vary much in the depth of the portion that is auriferous, sometimes as much as 40 feet has proved to be so, and appears to only require systematic working and capital to pay a large interest. It is impossible to give an idea of the extent of this lead, as those versed in geology conclude it to be the ancient bed of a river, and may be traced for many miles.

The old creeks, such as Oakenville, the Happy Valley Creek, Spring Creek, &c., have been nearly worked out, and now only pay large parties to work in a face by sluicing, and a few parties, mostly Chinese, are so employed; some of the points are also being worked.

Happy Valley Creek varies from about a $\frac{1}{4}$ mile to about 100 yards in width. Oakenville may average about 50 yards. The Alluvial, at Bowling Alley Point, was principally surfacing, excepting the river bed and banks. In many places it was very rich. It has been worked for 5 or 6 miles. There are at present only three or four small parties, Europeans and Chinese, engaged sluicing along the river banks. At the Hanging Rock there are two parties mining in deep ground at Harden's Hill and getting payable gold. Supposed to be a break from the Cement Lead. There has been a great deal of surfacing done and gullies worked, now abandoned.

Alluvial Claims.

(1.) The Nundle Cement Gold Mining Company's Cement Claims, Mount Misery, are idle and have been for many months. The deep shaft on this claim is 210 feet, and worked out in large blocks from the bottom of the shaft. The Company has a steam crushing machine on the claim, fifteen-horse power with ten stampers. I cannot ascertain the yield of gold from the Cement.

(2.) John Blake's lease, 1 acre, Alluvial Cement, Mount Misery; three men at work; have a tunnel driven into the hill through the cement about 250 feet; not on gold yet.

(3.) Joseph Paties' and James M'Gregor's alluvial sluice claims earning wages.

(4.) Powell's, &c., alluvial cement claims all idle for many months.

(5.) Mr. G. Bond & Co., Alluvial Cement Lease, at Danger Gulley, at work driving a level into the hill, looking for Mount Misery Cement Lead.

There are not any other alluvial claims at work only a few creek claims, which are chiefly worked by the Chinese. It is impossible to ascertain the yield of gold.

As near as I can ascertain the quantity of gold won on these diggings during the year 1875 is from 1,700 to 1,800 ounces.

In respect to reefs opened at Hanging Rock Foley's Folly, and Nundle, I dare say there may have been fifty opened, but only one worked to any extent, viz., the "Wheal Prosper," at the Folly.

Gold has been found in most of them, and fine specimens got; and I think the reason of most being abandoned has been want of capital to work them. It is impossible for me to give information respecting bearings, dips, &c., as they are not being worked. The "Wheal Prosper" runs N. and S., and dips to the W. The average width of this reef is 6 inches, and has been worked in different places for a distance of 2 miles.

The manager did not feel himself at liberty to give any information respecting the gold obtained, but referred me to the legal manager, at Sydney.

There are several reefs at Bowling Alley Point, many of them rich; none, however, upon the Government side of the river are being worked. They are principally held by leaseholders, and have not been at work for many months. I am informed that shafts have been sunk 200 feet. The general bearing is E. and W., dip S., except "Foley's" reef which is N. S., dipping E.

Nundle Quartz Reefs.

(1.) The Golden Streak Reef all idle for the last eighteen months or more. There has been several deep shafts put down on this reef. At a depth of from 30 to 50 feet there were several good samples of gold obtained, but not payable.

Hanging Rock Quartz Reefs.

(2.) The Wheal Prosper Gold Mining Company's Reef, at Foley's Folly, Hanging Rock, has been idle for the last three months. The deepest shaft on this mine is about 420 feet. There is a level driven into the hill for about 1,800 feet, meeting the reef nearly at the bottom of the deep shaft. The machinery used for raising the stone from the bottom of claim is a self-acting counter-balance winding machine, invented by the present mining manager, Mr. John Stanning. This machine is capable of winding up some scores of tons per day from the bottom of the deep shaft. The machinery used for crushing at this mine is four stamp-heads, driven by an overshot water-wheel.

(3.) Mr. Teddy Brooks & Co.'s Reef, at Foley's Folly, is being worked. They are driving a tunnel into the hill to meet the reef at a depth of about 150 feet. The tunnel is in the hill about 200 feet, but has not cut the reef yet.

Bowling Alley Point Reefs.

(4.) The Black Fellow's Nob Reef has been idle for the last twelve months or more. There have been seven deep shafts put down on this reef, two of which are about 200 feet deep, and the other five from 30 to 50 feet deep. The line of reef is east and west, dipping south; width about 1 inch, between a hard blue rock. Some few years ago there was an average of 30 ounces of gold per ton of stone raised in this reef.

(5.) The Opossum Company's Reef has been idle for the last twelve months or more. There is a level driven into the hill about 500 feet, meeting the reef at a depth of about 150 feet. There is about 100 yards of the reef worked along the surface. The line of reef is east

and west; dip perpendicular; width 6 inches; average yield of gold about 15 dwts. per ton of stone. This company has a 14 horse-power steam crushing machine (10 stampers), with one of Denney's Patent Pulverizers, a short distance from the claim.

(6.) The Tamworth Gold Mining Company's Quartz Reef, Foley's Reef, been idle over twelve months; there is a level driven into the hill about 300 feet meeting the reef at a depth of about 60 feet; twelve shafts have been put down on this reef, the deepest one is 220 feet, with a level driven along the reef from the bottom of the shaft for 220 feet, the line of reef is north and south dipping east, width about 18 inches, average yield of gold obtained about 1 oz. and 15 dwts. per ton of stone.

(7.) The Moonlight Quartz Reef has been idle for many months; there is a shaft 100 feet deep on this reef, and a level driven along the reef for a great distance. I cannot ascertain the full particulars, the crushing machine on the claim is an overshot water-wheel with four stampers, I cannot ascertain the yield of gold, but I believe there has been some very good returns obtained, and some not good.

There are other abandoned reefs which have been prospected a little, but I cannot ascertain what they are like.

There is an antimony lode at Nundle. It runs N. and S., dipping W. It has only been opened at the top. I will endeavour to send a sample by next mail.

I have made inquiry of gold buyers of the amount purchased by them, but I find, as to the actual amount produced there is no reliance, as a great deal is sent by mail to Sydney and Tamworth.

PEEL AND URALLA DISTRICT.—WALCHA DIVISION.

(*G. A. Buckland, Mining Registrar.*)

I HAVE the honor to inform you that I proceeded to Glen Morrison yesterday to see how the prospectors and others are proceeding at the diggings. I found only three claims at work, but two or three are making preparation to commence work again. The first I visited were "The Prospectors of the Golden Bar Reef," viz., Maloney and Party, they have eight men at work and raising very fair stone. I saw a very good prospect out of the reef from a depth of 90 feet. They have also two other levels at work about 80 feet deep, and getting good stone; the reef varies in thickness from 1 foot to 2 feet 6 inches and gold right throughout. I then proceeded to the prospecting claim of the "Golden Star," viz., Stratton and Company, where I found them working at a depth of 90 feet in the main shaft. The reef here is very small but exceedingly rich. They have had a crushing out of this shaft of 16 tons of stone which yielded 207 ozs. They have also two other shafts about 50 feet deep, and are getting rich stone from each. The reef is still very small. After going to the prospecting claim, I proceeded to No. 1 north, where I found three men at work, viz., Farrell and Company, they have a main shaft 110 feet deep, but are now putting in a drive at a level of 70 feet where they have struck the reef. The vein here is very small varying from 6 inches to a foot, and very difficult to be got at. They have just sent a trial crushing of 10 tons to the machine but expect the yield to be small. No. 2 north and No. 2 south on this reef are making necessary preparations for work, and expect to be hard at it in a week or so.

PEEL AND URALLA DISTRICT.—BINGERA DIVISION.

(*Michael Doyle, Mining Registrar.*)

THE Mining carried on at present in this division is very limited in extent, in fact, it is almost a thing of the past. If however rain falls, and water becomes plentiful, a good many miners may be expected to locate here during the winter months to prospect in the shallow alluvial ground. What little work that has been going on is now at a standstill for want of water which is becoming very scarce. No quartz mining whatever is at present carried on in this division.

PEEL AND URALLA DISTRICT.—SCONE DIVISION.

(J. T. Wilshire, *Mining Registrar.*)

BEYOND the English Cq. (Fuller's Reef Gold Mining Co., Limited), who are still carrying on operations, there are but very few miners at work, and these are only fossicking about the gullies and creeks, and occasionally obtaining small quantities of alluvial and reef gold, which they are in the habit of disposing of privately out of this district. A few nuggets in this manner have been got, but I have not been able to ascertain their nature or value. A coal seam was opened up, near Mount Wingen, and a considerable outlay incurred, but the works have been at a standstill for the last two years. The same may be said respecting some silver mines in this district. Leases for mining for sulphur have been taken out at Wingen, but the works have not yet commenced.

PEEL AND URALLA DISTRICT.—COPE'S CREEK DIVISION.

(James Lucas, *Mining Registrar.*)

THE general progress of these mines has been retarded by several causes, the principal of which are as follows:—1st. Want of water; of which there has not been sufficient to work the back blocks profitably. 2nd. The high rates of carriage; and lastly the non-cancellation of the leases taken up under the Act of 1861.

During the year a township, called Wrighton, has been formed, about $2\frac{1}{2}$ miles west of Tingha, and situated on the main Cope's Creek. In this neighbourhood the bed of the creek is being worked and is extremely rich. This land is held by the original lessees who work it by letting on tribute. At present the bulk of the population is here.

About 2 miles north of Tingha some rich land has recently been discovered; this is situated on a ridge. Tin is got from the surface to a depth of 30 feet. The formation of this country, of which there is a considerable extent, is metamorphic slate at its junction with that of granite. This kind of country is likely to eventually prove very rich, but its development at present is retarded by want of water.

There are six steam engines actively employed in the neighbourhood of Wrighton, varying from 3 to 12 horse-power. These are employed to keep down the creek soakage. At the Tingha a crossing of the Inverell Road, at the township of Tingha, an engine of 10 horse-power working a 5-stamp battery, has been employed until lately in crushing stone, but is now idle for want of water.

The following is a list of the principal reefs in this division, as well as underground workings by tunnelling:—

Bolitho Mine.—Depth 100 feet. Idle for last six months.

Black Angel.—This claim is worked by tunnel, which is driven into a hill for the distance of 250 feet. The formation of this hill is metamorphic slate in conjunction with granite. Bismark, situated on the opposite side of the hill to the Black Angel; a tunnel has been driven into the hill for about 100 feet, following a reef, but has not been worked for the last six months. Hit or Miss Mine; depth of shaft on tin lode 70 feet; idle for want of machinery. Grove's Bank; four shafts; deepest 50 feet; average crushing 300 lbs. to the ton of stone; this reef is owned by the proprietors of the battery above alluded to.

About 2 miles from Tingha, on the Inverell Road, a person named Brickwood is sinking in alluvial. One shaft is sunk 50 feet.

Sydney Company.—Not working; want of water. Ancient Briton, ditto. Stanifer Mine, ditto. Boundary Mine, deserted.

PEEL AND URALLA DISTRICT.—INVERELL DIVISION.

(W. Clare Cardew, *Mining Registrar.*) •

MINING operations entirely confined to Middle Creek, which has been nearly deserted for some months past. There is no mining plant nor machinery of any kind. The Sydney Tin Company is the only company on the creek, and they employ twelve men on tribute, and have raised about 10 ton of stream tin during the last quarter, besides which there are about thirty men mining and fossicking on their own account in separate parties of two and three. From

reliable authority I have ascertained they are barely earning a subsistence. It would be difficult to say the exact amount of tin they are getting, but about 100 tons have been raised during the year.

There is no gold nor ore raised in this division.

PEEL AND URALLA DISTRICT.—URALLA DIVISION.

(*William J. Tippet, Mining Registrar.*)

THE mines (gold) in the Uralla division are at the present time very dull. The shaft, 20 feet deep, now worked by Smith and party (5), gold average 4 ozs. to the load of wash-dirt obtained. In fact this shaft is the only one at present in full working order.

There are several sluicing claims, however, which realize 2 to 3 ozs. to the load of wash-dirt obtained.

There are no coal, tin, copper, or iron mines in the Uralla division, and the Rocky River Gold Field at the present time is very dull. Payable gold has been found, however, at a depth of 100 feet at Mt. Walsh, and hopes are entertained that this part of the gold field will eventually turn out well. Payable gold has also been found at a depth of 90 feet at Doherty's Hill, another part of the Rocky River Gold Field.

PEEL AND URALLA DISTRICT.—BARRABA DIVISION.

(*John Flanagan, Mining Registrar.*)

THE miners in this division are scattered over a large area, and may be more properly called prospectors and fossicking for gold. They all complain of the want of suitable machinery to give the quartz being obtained a fair test. The two machines now on the diggings are said to be most inferior and old.

Scarcity of water and dry weather caused several of the miners to suspend work, and one of the quartz crushing machines is also idle at present from the same cause. Many of the miners are doing little or nothing, and follow other occupations, such as shearing, reaping, &c., and then return to the diggings.

NEW ENGLAND, CLARENCE DISTRICT.—VEGETABLE CREEK DIVISION.

(*George H. Gower, Mining Registrar.*)

I HAVE the honor to forward for your information my report for this year, 1875, on the tin mines in the Vegetable Creek division.

The yield of tin ore for the past twelve months from these mines is most highly satisfactory, having exceeded that of the previous year by over 980 tons. This will be accounted for by the fact that these tin fields have not suffered so much from the want of water for sluicing purposes as during the previous year, also that the mines are getting developed, and the appliances for sluicing tin have been so vastly improved.

Some of the Vegetable Creek mines have been worked for three years, and have still a good deal of work before them, the banks and flats adjacent to the creek bed not having been even extensively prospected, though highly satisfactory results have been obtained in a number of instances. Certainly there have not been as many mines working as during the proceeding year, as in some instances the heaviest deposits of ore have been worked out where they were easily got, and the owners not having sufficient energy or capital to prospect their holdings any further, have disposed of their land to others; the purchasers, however, during this year intend to thoroughly test their value, and work most of the land over in a proper and systematic manner; but in most cases the low price of tin and the great expense of labour, have compelled some of the owners of mineral land to cease all further operations till there occurs a rise in the tin market.

Upon that property known as Tomison's, consisting of 20 acres (situated adjoining and west of the Great Britain Tin Mine) which in 1874 yielded 52 tons of tin, all work has been entirely suspended during 1875, it has been bought by the Great Britain Co., whose manager at present is cutting a large tail race through it to drain the lower part of that mine, where the largest plant in the way of machinery and tin dressing appliances has been erected on Vegetable Creek.

The Rose Valley Mine, situated $1\frac{1}{2}$ mile, south of Vegetable Creek, yielding in 1874 100 tons of tin, has during 1875 been lying idle, the proprietors not having sufficient capital to carry on further operations, and thoroughly test its value. When this property was first taken up tin was found in payable quantities in the surfacing, which was gradually traced down to a depth of 54 feet, through a volcanic formation.

The wash was payable in the run of the bed (a width of 25 feet in a length of 29 chains) but having been let by its proprietors to several different parties on tribute, who all worked out the richest patches of tin occurring in the lead, eventually the run was completely lost. I consider that this mine has not had a fair trial, but lately the property has changed hands, and the owners, Messrs. Irby, Andrews, and O'Donnell, of the Little Wonder Mine, Vegetable Creek, intend to start active operations here during this month, when I have no doubt their energy will be rewarded.

Messrs. Hall, Brothers, and Co., have also ceased work at their selections at the Springs, Sugar-loaf Mountain, Kangaroo Flat, Strathbogie Run, and also at the Six-Mile Mine, Vegetable Creek, on account of the low price of tin. So that the returns of tin from this Company alone is just one-half that in 1874, being 200 tons of ore for 1875, as compared with 400 tons raised in 1874.

The Banca Tin Mining Co., and the Glen Creek Tin Mining Co., situated on the Glen Creek, have done nothing in the way of tin raising during 1875, nor have two or three mines at Tent Hill, all on account of the fluctuating state of the tin market.

All the mines (enumerated above) have consequently contributed nothing towards the very large yield of tin, 3,042 tons for the year 1875, which I think speaks volumes for the progress and flourishing state of the tin mines situated at Vegetable Creek proper.

Six of the principal mines,—the Vegetable Tin Mining Co., the Great Britain, the Baalgammon, Moore and Speare's, the Little Wonder, and the Nonpareil Mines, which, in 1874, raised between them, 999 tons of ore, have during the year 1875 raised 2,063 tons of tin, and even this yield would have been increased, if it had not happened that on the richest mine, that of the Vegetable Creek Tin Mining Co., all operations were suspended for three weeks, during August last, means of transit not being procurable for the very large stock of tin (280 tons) on hand; the roads between this and Grafton being impassable. This obstacle assumed alarming dimensions, and at one time, in some quarters, it was thought a total suspension of mining operations on the creek would have been the result. This, however, was fortunately averted by a timely appeal to a Queensland commercial firm, by whom numerous teams were speedily despatched to remove the accumulated mass of tin ore. As it is, short lived as was the suspension of mining operations, many of the claim-holders could not avoid ceasing work, for I have been assured by a good many of them that there were over 550 tons of ore at one time awaiting transit on the creek, and pay what they would, they could not get teams to remove it to Grafton. But since, arrangements have been effected by sending most of the ore *via* Brisbane to the Sydney market; mining operations on the creek have been carried on as briskly as ever. The price of carriage by the new route, although higher than that by Grafton, is balanced by the ore being landed many days sooner *via* Brisbane; the cost of carriage *via* Warwick is £7 10s. per ton, and thence to Sydney is £2 5s., while by Grafton, ore can be landed at Sydney for £9 on an average, all the year round.

There are but ten mines of any note raising tin, along the course of Vegetable Creek.

The Great Britain Mine.

The Great Britain Tin Mining Co., situated at the head of Vegetable Creek, is a property consisting of 520 acres, conditionally purchased; the wash-dirt in this mine is very poor as compared with what is being raised lower down the creek; and the large yield of 431 tons for 1875, is only to be accounted for by the mine having been properly opened out for the raising of wash-dirt in a legitimate manner, and more particularly by the most approved and best appliances for extracting tin from the gravel, both by steam and horse-power, having been erected.

In my report for 1874, I had the honor to forward for the information of the Honorable the Minister for Mines, a detailed account of the horse-pumping gear and cylindrical sieve, as used so successfully on this mine, by which a very much larger amount of tin-bearing wash-

dirt could be operated upon, than by any of the original appliances. This machinery has again been very much improved upon by using steam, instead of horse-power. At the lower part of this mine the wash-dirt, being still poorer than it is higher up the claim, has taxed the ingenuity of the Manager, Mr. W. H. Wesley, to invent some appliances that would put through twice as much staniferous wash, and at the same time return as much tin as is being raised on the other two points of operation. This he has accomplished most successfully; two large puddling-machines are worked by a 12 horse power portable engine; the engine also works a centrifugal pump, to lift water for all purposes required at the works. The puddling-machines are driven by a belt and pulley and bevil gear; the whole apparatus is elevated 6 feet over the surface, to command a fall for the sluice-box or other machinery that may be erected for separating the tin ore. This gives a fall sufficient to command the removal of all refuse by trucks and horses, without being handled with a shovel; on each side of the puddling-machines a dray road is made, at a gentle slope from the surface, level with the top of each puddling machine; the wash-dirt is taken from the faces, and tipped direct into the machine by drays; one puddling-machine being filled while the other is emptied. It requires fifteen men to empty each machine—that is ten men filling, and five men wheeling barrows. The dirt is wheeled from the machine into a hopper, arranged for the reception of the stoney dirt; over this hopper there are four spouts of water, conveyed by gas-pipe tubing, arranged to wash all the dirt tipped into the hopper, into a cylindrical sieve, which is driven by a belt and pulley from the main shafting; the cost of feeding is dispensed with. At present a large sluice-box is in use for sluicing, all the refuse being carted away to make permanent dray roads, and when completed, trucks and horses will be substituted for removing the tailings and hopping (pebbles). It requires eight single horse drays carting wash-dirt, which fill one machine in two hours; thus four puddling-machines are emptied and sluiced each day, amounting to not less than 120 tons of dirt. If the puddling-machines were made to be self-emptying a considerable saving would be effected, but they would require iron bottoms, and to be elevated at a greater height over the surface to work successfully, and the cost of constructing them would be a considerable item. The sluice-box at this engine is fixed temporarily, whilst another new tin dressing machine, also the invention of this skilful gentleman, Mr. Wesley, is being made.

There are 140 men and 80 horses employed on this one mine; the average weekly yield of tin ore is (12) twelve tons; the total yield for the year 1875 is (431) four hundred and thirty-one tons, being about three times that of the year 1874.

Tomison's Mine.

Tomison's Mine, adjoining the Great Britain, westerly, consisting of 20 acres, has been idle all the year, having been bought by the above company.

Little Britain Mine.

The Little Britain Mine, adjoining Tomison's, embracing 40 acres of mineral leased land, continues to be well worked, and is yielding fairly.

The yield of tin for the past twelve months was (105) one hundred and five tons. In the earlier part of the year all work was suspended on this property for two months, on account of the low price of tin.

Little Wonder Mine.

The next mine adjoining is the Little Wonder, consisting of 40 acres.

This mine was considered worked out when the present proprietors, Messrs. Irby, Andrews, & O'Donnell, bought it for £400. The original holders had worked out the richest deposits of tin, and afterwards let it on tribute to several parties who never worked the land legitimately, hence could not make it pay; but under the management of one of the present proprietors, Mr. O'Donnell, this mine is now in a most flourishing state, and can be ranked as one of the principal tin producing properties on Vegetable Creek. The average depth of stripping is from 4 to 5 feet of a kind of sandstone and cement; and the depth of wash-dirt is about 7 feet, which in some places is so much cemented together as to require the use of blasting powder. The wash is a regular clayey creek wash, with large stones, and requires

grinding before the tin can be extracted, for which purpose five puddling machines have been erected close to the sluicing appliances, of which there are two large sluice boxes, with the hopper plates; the water being pumped by horse power. The yield for the past year from this mine is one hundred and thirty-nine (139) tons of tin—more than double that of 1874. There are thirty-two men and seven horses working; the average weekly yield is $2\frac{1}{2}$ tons of tin.

The present proprietors deserve the greatest praise for the manner in which they applied a large sum of money in opening up and properly developing this now very valuable property. They have also bought up some other holdings which have not been raising tin for the past year, but it is their intentions to start active operations on them, and work the land in a proper and systematic manner. At present Messrs. Irby, Andrews, & O'Donnell own 200 acres of mineral land on Vegetable Creek.

Moore and Speare's Mine.

Messrs. Moore & Speare's Mine joins that of the Little Wonder, and still maintains its position as the richest and the largest tin yielding property on the course of the Vegetable Creek proper, having produced 450 tons of tin for the first year. Most of the shallow ground has been worked, and the stripping is from 6 to 7 feet, possessing in some places the appearance of ferruginous sandstone. The wash-dirt is on the average $2\frac{1}{2}$ feet thick, and the tin very thickly interspersed throughout. There are sixty men and seven horses employed, raising on an average 10 tons of tin per week. A large quantity of ground still remains to be worked on this mine, as the banks which have been proved payable have hardly been touched.

Baalgammon Mine.

The Baalgammon Mine, joining the above-mentioned, is also a very rich piece of land, having yielded 180 tons of tin for the year 1875. This property consists of 40 acres only, and has already paid £10,000 in dividends. Since operations first started, about three years ago, some good patches of tin have been obtained. In one instance 50 tons of tin was washed out from an area of $1\frac{1}{2}$ chains by 1 chain in the creek bed. The average depth of stripping is about 5 feet, and depth of wash $2\frac{1}{2}$ to 3 feet of clayey creek wash. Two puddling machines have been erected, as the dirt requires puddling before being taken to the sluice box, which is fitted with a hopper plate, and supplied with water by a horse pumping machine. The average yield per week is $3\frac{1}{2}$ tons, with twenty-four men and four horses.

Nonpareil Mine.

The Nonpareil Mine is also a very remunerative property, consisting of 40 acres. On this mine some extremely rich patches of tin have been found—the return for the year is 122 tons. Seventeen men are engaged in raising $1\frac{1}{2}$ tons per week.

Hall Bros. & Co.'s Vegetable Creek Mine.

Messrs. Hall Bros. & Co.'s Vegetable Creek Mine, comprising 280 acres of purchased land, is also a very valuable property. The yield of tin for the past year is 80 tons, this is smaller than that of the previous year, which is to be accounted for by the small number of men engaged during the twelve months, owing to the fall in the tin market. The system of sluicing here is quite different to any other on the creek; a long flood-race has been cut along the bank of the creek, and paved with stones, this race is covered over a long distance with saplings, on the top of which the tin stuff (that does not require much puddling) is piled up, a height of 6 or 8 feet; when a thunder storm occurs, a large head of water is turned into the race, the saplings are removed and consequently the dirt falls into the race, in which there are three or four men with sluice forks and shovels removing the stones and boulders, and working up the wash-dirt, in this manner a very large quantity of dirt can be ground sluiced, with a few men; when the head of water gets less, it is turned off, the flood race is then cleaned up, and the fine dirt is wheeled away in barrows to the sluice box, where the tin is extracted in the usual manner. The width of the tin bearing wash in this mine is over 100 yards, with an average depth of $2\frac{1}{2}$ feet, a great quantity of ground, proved payable, still remains to be worked, the wash is a very heavy creek wash with a vast quantity of large stones.

Rothschild's Mine.

Rothschild's tin mine, situated adjoining Hall Bro.'s & Co.'s Vegetable Creek mine, along the course of the creek, embraces 240 acres of tin land; on this mine two excellent dams have been erected, which having a large water storage, have enabled sluicing operations to be carried on with some regularity. The wash is not very rich, though some good deposits of tin have been found, it averages in depth about 4 feet of a sandy creek drift, with a large quantity of stones, and does not require much puddling. The width of payable dirt is from 50 to 100 feet, the stripping is mostly easy. A large flat 300 yards square on the banks of the creek has been proved to contain some excellent tin, prospects as high as 2 lbs. to 3 lbs. to the dish having been obtained, this alone will take a considerable time to work out, and I have been assured by one of the proprietors, that it would take five years to work out this property if they employed the same number of men, as were engaged during 1875. The yield for that year was (115) one hundred and fifteen tons of tin with twenty men.

Gordon's Mine.

Gordon's mine is the last of note along Vegetable Creek. The lead here is very narrow, not being more than 50 feet wide. From surface to bottom, a depth of from 2 to 5 feet is sluiced, and that in the original style of working tin, with the sluice fork and narrow box. Numerous parties of tributors have worked this mine, who have together raised during 1875, 80 tons of tin, at present there are but four men employed on tribute, who seem to be making current wages.

The above is a detailed list of mines raising tin in the bed of Vegetable Creek, a length of about 3½ miles.

Y Water Holes Creek.

Another portion of this tin field where tin is obtained under shallow stripping, and to which some attention has been directed, of late is the Y Water Holes Creek, situated 2½ miles south-east of Vegetable Creek. Rich patches of tin have been taken out of the creek near its junction with the River Severn, and it is only within the last few months, when a large portion of the leases had been published in the *Government Gazette* as forfeited, a few miners were induced to prospect that creek thoroughly. Surfacing was found at the very head of the creek, on the hills on either side, with prospects as high as 1 lb. to 2 lbs. of tin to the dishful of dirt, with an average depth of 1½ feet from the grass to a stiff clayey bottom, in this coarse tin is plainly visible, but it would require to be well puddled before the tin could be extracted. Three large horse pumps with sluice boxes are erected and kept continually washing this surface soil, and as much as 2½ tons of tin have been raised with six men and one sluice box in one week. On the lower part of the creek, near its junction with the Severn, some parties have been making a comfortable living, for the past two years, with very primitive appliances for washing. There is hardly any stripping, and that only on the banks, which is mostly either sand or black loamy soil.

A most curious and interesting discovery was made, in this portion of the Y Water Holes Creek, a tree 4 inches thick and 6 feet long was found, lying on the top of the wash dirt, and under 5 feet of black loamy soil, at one end of this tree, which is still sound, a clean cut as if from a tomahawk or some other sharp instrument was observed. Lumps of fossil timber or wood are frequently met with in the wash, which is composed of a sandy granite drift, and large waterworn granite boulders, colored stones are also found in it, which, I believe, are of no intrinsic value. The want of water for sluicing purposes is very much felt at this portion of the tin fields, as the only supply at present exists in several large natural water-holes; if a large supply of water could be brought on, an increased area of surface soil, already prospected as payable for tin, but now idle, would be worked to great advantage.

Graveyard Creek.

The Graveyard Creek, 1 mile south of Vegetable Creek, has also been worked to some little advantage, but the want of water and the low price of tin have been the cause of all works being entirely suspended here at present.

The want of a permanent supply of water on the mines of New England is what in a great measure materially retards their development. Every person owning tin land at Vegetable Creek, and in its vicinity, has either to excavate a reservoir when the deposits of tin to be worked occur in a flat, or erect a large strong dam if the operations are in a creek bed. All the mines depend entirely on storm-water, hence (as happened in the latter end of 1874 and the beginning of 1875) during a drought of a few months duration, most of the mines have to cease operations till rain falls to fill up the dams and reservoirs.

I think there could not be a more remunerative investment of capital than would be found in supplying Vegetable Creek and the mining localities radiating from it as a centre with permanent water. If the Government would set apart a sum for the construction of a race from one of the permanent rivers in the neighbourhood of Vegetable Creek, thousands of acres of staniferous lands now untouched, or but partially prospected, could be commanded by such race, and be worked with very satisfactory results to the miner, proving also a most important source of revenue to the Government.

I refer more particularly to the vast tract of land composed of volcanic ridges, which have already proved to be staniferous both here and at distances of about 15 and 25 miles from Vegetable Creek, and not only these but the Vegetable Creek mines that have hitherto been found so rich in tin deposits would be re-worked, as the wash-dirt in the majority has been treated with but very primitive appliances, and a very limited supply of water.

The residuum in that water-course would yield a large percentage of ore, while many adjacent spots at present not payable would likewise receive attention. This can be readily understood when it is considered that a miner is able with a plentiful supply of water to reduce on an average 20 to 30 tons of dirt per day. Yet some vast tracts of land, containing almost incalculable wealth must remain dormant. The miner has the power and the will to develop, but no water.

This question is at present engaging the attention of some of the holders of large areas of mineral ground, and it is, I believe, confidently asserted that water could be brought by means of a race 20 miles long from the Severn or Deepwater Rivers. This, however, would be reserved by private individuals for their own use only. Their object being to buy up the nominally worked-out holdings, not to facilitate the development of land for others. I do not therefore contemplate any additional revenue could arise therefrom if this were left to private enterprise; on the contrary it would lock up immeasurable areas for an indefinite period.

The Victorian Government arranged to set apart a certain sum to supply water to the gold fields and mineral tracts, and by selling the water to the miners the outlay has been repaid one hundred-fold. I am confident that such would not be the only results that would follow the supplying this portion of New England with water, since large tracts of Crown Lands suitable for agricultural purposes also exist near these fields, and offer tempting inducements for the location of a large population if water were available.

Red Hills or Volcanic Formation.

Another matter of the greatest importance to the advancement and development of this district, to which I would wish to call the attention of the Honorable the Minister for Mines, is that of allowing pastoral tenants and free selectors to monopolise such extensive areas in the vicinity of Vegetable Creek. I refer especially to that soil known as red or volcanic. It has been bought and selected in very large areas lately, not for the purpose of working for minerals but for grazing and agricultural purposes, the soil being very rich, and the grass growing on it very fattening. Some of the richest deposits of tin, the deep leads, are now being found associated with such formation. But if squatters and selectors are allowed to buy up all that class of country in this neighbourhood for grazing or agricultural purposes, it will at once give a severe blow to the advancement of this important branch of mining.

Deep Leads.—Vegetable Creek Tin Mining Co., Limited.

Under this head, I would first mention the property of the *Vegetable Creek Tin Mining Co., Limited*, consisting of (1,200) twelve hundred acres of mineral land under conditional purchase, nearly all of it embracing a very large area of the volcanic formation, or red hills, it having been the first deep staniferous lead discovered and successfully worked, and I might

safely say the richest tin-bearing property in Australia. The further researches and workings of this company have proved without doubt that, as stated in my report of 1874, the workings are in an old river bed, now considered to have been the original water-course of Vegetable Creek.

This theory is substantiated by the discovery of a deposit of wash carrying black tin, and evidently from the wash and tin being similar, a continuation of the deep lead worked during the past two years on this property. The point at which this recent discovery was made is estimated to be, following its supposed serpentine course, about $1\frac{1}{2}$ miles from the wonderfully rich portion of the extinct river bed hitherto worked. The decomposed granite bottom or pipeclay of that water-course has remained almost level, at a depth of some 55 feet from the surface throughout the area worked during the past year, the fall being but slight southerly.

The depth of the shaft where the new discovery was made last month, from grass to wash-dirt is about 70 feet, and I am informed by two gentlemen of undoubted authority—Messrs. Cadell and Wesley, who together took the levels accurately—that a sufficient fall exists at that point to prove incontestably that the flow of the river was from the spot where the deep lead was first discovered by this Company, to that where the discovery of last December was made.

This new light has been thrown on the important subject by trial shafts having been sunk in a volcanic ridge. This discovery proves my remarks to be not injudiciously made relative to the exception of such leads from selection for pastoral and agricultural purposes only. Over the deposit worked during the past year no material change has been observed in the formations through which shafts have been sunk, but where the new discovery I have referred to occurs the absence of the hard basaltic rock is a distinguishing feature. The principal stratum of pipeclay is present, but at the 70 feet level, carries impressions of leaves in profusion. With but one exception I have not heard of such having been previously found in the clay over the deep lead in this Company's land, but similar impressions exist over the tin bearing wash in a volcanic ridge, the property of Messrs. Hall, Bros., and Co., 25 miles north-west of Vegetable Creek.

The superficial area worked during the past year on this Company's land is 2 acres and $11\frac{1}{2}$ perches only, yet the quantity of tin ore raised and bagged from that small space has been 741 tons. The width of the face of the wash-dirt in December, 1874 was about 200 feet, since when it has increased (I am informed by the Manager) to about 600 feet. Even this measurement does not represent the limit, since latterly its bounds have not been reached, the untouched portion being reserved to be worked from new shafts. The average depth of paying dirt throughout the face (600 feet) is about $3\frac{1}{2}$ feet of extremely rich wash-dirt, which increases in thickness as it advances.

The wash-dirt in several parts of the lead has sometimes a depth of 7 and 8 feet of sand with very fine tin all through it, and below this, lying on the soft decomposed granite bottom, are 18 inches to 2 feet of gravel, in many parts half of it tin ore. This gravel is composed of round pebbles and water-worn pieces of quartz, with very fine tin all through them, which is a strong indication of the existence of a tin lode in this neighbourhood which has fed this wonderfully rich deposit of ore. Large fragments of black stone, which are supposed to be petrified wood, judging from their appearances, are generally found associated with the richest patches of stream tin. White quartz crystals are often met with also, but very few colored stones are ever seen.

About four months ago when the lead was about 500 feet wide, quite in the centre of the run of wash, a large hollow was found about 50 feet long and 5 feet high, which seemed to have been the bed where a large fallen tree had lain, and at its roots, or where the roots had been, about 5 tons of pure ruby stream tin were obtained, and on either side to the bounds of the lead was nothing but black stream tin. This was the only instance in which ruby tin was washed out from this lead.

The great depth of wash necessitates the use of a large quantity of timber to keep up the ground, as not sufficient headings or bottom are taken up to fill the spaces worked out. This mine is without doubt exceedingly well timbered, and every precaution is taken to avoid any accident happening to the men. The main drives are traversed with tramways, and

branch tramways are laid as close as convenient to different parts of the face, so that the wash-dirt is shovelled into the trucks, which are run by men to the chamber at the bottom of the main shaft, and then tipped into large green hide bags, and hauled up by means of a horse whim to the surface, where again another tramway is laid, on which three trucks, holding 1 ton of dirt each, are run to the two sluice boxes.

The landing-place on the top of the shaft is elevated about 6 feet from the surface to admit of the trucks being brought up, so that the wash-dirt is conveniently tipped into them.

The tramway is 300 yards long, set with a slight fall, and the wooden rails are shod with thin iron to allow the trucks to run more quickly and freely than on wood, besides preventing the rails from being worn out too soon.

The sluicing appliances used on this mine are two sluice boxes supplied with cylindrical sieves, and worked by horse-pumping gear, being counterparts of those used at the Great Britain Mine. There is not the slightest doubt that if this mine was not using the cylindrical sieves that it would be utterly impossible to put through or operate on the same quantity of dirt. Only one cylindrical sieve was erected here, in the first instance on trial, and it was found such a great success in both the saving of labour and washing such a large quantity of wash-dirt (which being composed of only sand and gravel, and hence washing very easily), that another one was erected. With this addition the monthly yield of tin was more than doubled. The sluice boxes are parallel with each other, set 20 feet apart, leaving a space for the reception of the wash-dirt brought down by the trucks. As will be seen by the enormous yield of 741 tons of tin from this one mine for twelve months ending 31st December, 1875, a very large amount of gravel must be put through per day. The number of trucks or tons of wash-dirt operated on weekly, with two sluice boxes, seventy-two men, nine boys, and seven horses, is on an average 360, and the average yield per week for the last five months the mine has been working is about 24 tons of tin. When only the rich gravel and very little of the sand referred to above is trucked down to the sluice boxes to be operated on, the yield has in several instances exceeded 30 tons of tin per week. The refuse or tailings from both boxes run into one pit, in which three men are required to shovel it into trucks to keep the tail pit clear. The trucks (three) are pulled up by a horse on a gradual incline and tipped. The length of the new tailings heap, made only since September last, is now about 200 feet, the width 20 feet, and at the tip the height is about 18 feet. It would certainly have been a wonderful saving both of horse and manual labour if the sluice boxes could have been placed at such an elevation that the tailings or refuse could have fallen into a large box or bin, under which trucks could have been placed, on the same principle as that now in use on the Great Britain Mine, but it was found impracticable, as the lift of water by the California pumps would have been too heavy for horses to work.

The scene of operations being now on a large flat, it was deemed far more economical to cut a head race from the dam 250 yards lower down, and so bring the water as near as possible to the workings, than to go to the expense of excavating a large space for water storage, and wait the chance of a large fall of rain to fill it up. A tail race, the same length as the other, is cut to the head race, so that the water after being pumped and used at the boxes runs back into the dam.

Considerable improvements are being made by the managing partner, Mr. J. J. O'Daly, in the effective working of this very valuable mine, a new main shaft is sunk, a second horse whim is erected, and a tramway laid ready to start work at once, and he has every hope of raising during the year 1876 not less than 1,200 tons of tin, with the usual compliment of men and boys. Most of the tin from this mine has lately been sent by way of Warwick and Brisbane to Sydney, means of transit *via* Grafton not being always to be depended upon.

The amount paid by this Company for the carriage of ore from the mine to Grafton and Brisbane during the year 1875 was £6,022 2s. 2d., so that you will see it is a considerable item in the expenses of working a large tin mine.

All the ore is smelted in Sydney and then shipped to the London market direct. The reason this mine, although so rich, has not been more rapidly developed, is that no capital has ever been called for, it having paid its own working expenses.

Campbell and Gibson's Mine.

Adjoining the above company is Campbell and Gibson's block, in which some excellent wash has been found at 70 or 80 feet from the surface, it is supposed by some to be a continuation of the lead; as yet it is only partially prospected, the bottom being very uneven, and by present appearances seems to be like a feeder to the lead worked in the above mine.

Kangaroo Flat.

At Kangaroo Flat, 13 miles north-west from Vegetable Creek, tin has also been found under the volcanic formation at a depth varying from 20 to 90 feet.

Messrs. Hall Bros. & Co., who own a large tract of mineral land here, have spent a considerable sum in prospecting and developing it. Tunnels 200 feet long have been driven into the sides of the hills at a depth of 90 feet from the surface, but unfortunately have not struck anything exceedingly rich; but what ground they have tested by shafts and tunnels would pay very remuneratively if the tin market were to rise a little, more particularly if a permanent supply of water were available.

No work has been done here for the past twelve months on that account, and for the same reason the above-named gentlemen had to cease all operations at their selections at the Sugarloaf Mountain, near Kangaroo Flat, and at The Springs. Tunnels have been driven on the wash in both these properties, and good tin was found in the hills at a depth of 180 feet from the surface. Large pieces of petrified wood are strewn over the greater portion of this section of the tin fields. Tin is to be seen in greater or less quantities all over the low spurs by blowing on the surface soil, they being situated below the supposed old river bed.

There is no doubt some very heavy deposits of tin will be found here, but it would require capital, and above all permanent water. The gullies are very steep and have such a rapid fall that a day after a heavy thunder storm they are as dry as ever. Dams have been erected, but there is no space in the gullies for a large water storage.

Rocky Creek.

At Rocky Creek, 25 miles north-west of Vegetable Creek, some excellent tin-bearing wash has been found under the red soil; in fact in some places the deposit, consisting of splendid river-bed wash, has been proved payable to a depth of 12 feet. It is here that impressions of leaves have been also found, at a depth of only 3 feet from the surface, lying on the top of the stanniferous wash. Here, again, the absence of a permanent supply of water very greatly retards the progress of tin-mining. Immense areas of land of this formation, known to contain tin, must lie dormant on account of the want of water and capital.

Surface Hill.

At the Surface Hill, situated about 15 miles northerly from Vegetable Creek, some very rich stanniferous wash was traced into the hill. The original holders of this property obtained tin on the surface, and had to cart the dirt a distance of 3 miles to water to sluice it. This they found too expensive, although in some cases they struck some excellent patches of tin in the surface paddocks. They, however, disposed of their interest, and the recent proprietors traced the wash running into the hill under the volcanic formation. Not much work has been done here lately, on account of the low state of tin market, and the want of water. The tin and the wash found is of the same character as that obtained at the Vegetable Creek Tin Mine, Kangaroo Flat, Springs, and Rocky Creek, but the ore is more highly polished and the pebbles more spherical.

Tin Lodes at Mole Table-land.

The developement of tin lodes in this district has not proved as yet very successful. Good lodes have been discovered at the Table-land, but they are not so extremely rich as to induce the holders to go to much expense in testing them, and occurring as they do in localities difficult of access, it will be long before they are thoroughly explored, as capital can be expended more profitably in working stream tin both shallow and deep.

Planet Tin Mining Company.

Only very feeble attempts have been made to test the lodes, the greatest depth to which any shaft has been sunk did not exceed, it is said, 120 feet; at the Planet Tin Mining Co., Nine-mile Creek, Mole Table-land, a considerable amount of labour and capital were expended in this branch of mining by the company, but no permanent benefit was derived therefrom, for the veins either soon ran out or the stone below a certain depth became unprofitable.

It is to be regretted that the shafts have not been sunk deeper and stronger efforts made to investigate the character of the lodes at a greater depth. This company have the credit of erecting and working the first crushing and lode tin-dressing machinery in this Colony. The battery is furnished with all the latest improvements, carrying eight head of stampers. There was a large quantity of tin-stone to grass, but I have been led to believe that, after a trial crushing, but very little of it was found to be payable. Operations at present, I understand, are confined to breaking out leaders or veins very rich in tin, averaging a width of half an inch, which were exposed in the surface rocks; but up to the present time the yield of this mine has not been very satisfactory.

Byrnes' Reef.

On another lode, known as Byrnes' Reef, very good tin has been found in hard quartz. Two trial shafts have been sunk to about 18 feet in depth, and since filled up. Further operations were abandoned on account of the large quantity of water struck in them. The surfacing around the shaft has been very rich.

Dutchman's Reef.

At another lode known as the Dutchman's Reef, $1\frac{1}{2}$ mile from Byrnes; very good tin-bearing stone has been found. Only shallow cuts have been put on it, which disclose but imperfect indications of veins of ore.

The above are about the best known lodes in the Table-land. This portion of the New England tin fields has also been very rich in stream tin of which a great quantity has been raised since first operations started.

Mole Table-land.

The Catarrah Creek has been very profitably worked, a considerable amount of tin having been raised from it; but it wants capital to work on a large scale, as the sinking is now both too deep and wet for a small party of miners to work.

The Bullock Swamp Creek has been worked, in the early days of tin mining, in various spots from its sources to the Glen Creek, as has also the Highland Home Creek; but most of the operations have ceased in a good many creeks and gullies on account of the low price of tin.

Flagstone Creek and Black Swamp Creek, all tributaries of the Glen Creek have yielded pretty good tin, they are still supporting a fair population, who seem to be making a comfortable living in gully raking; but the deposits on the Table-land seem to have been but patchy.

Blather Swamp, Carpet Snake, Bark Hut, Black and Lottery Creeks, tributaries of the Mole and Sovereign Rivers have all been worked more or less profitably, but all large operations in tin raising have long since entirely ceased, both on account of the fall in the tin market, and also the very limited supply of water usually found on the Table-land, still I believe rich finds may yet be made.

Glen Creek.

From the Glen Creek northerly to the Mole Table-land, there are several lodes, which have been sank on, from 3 to 25 feet, and are of such a character and richness as to warrant an outlay in thoroughly testing, if capitalists could get the properties on reasonable terms. They vary in width from 6 inches to 6 feet, and are in many instances extremely rich in tin ore.

The gullies in the proximity of these lodes have been very profitably worked for stream tin.

Tent Hill.

Tent Hill is the locality where stream tin was first discovered in payable quantities in this district. It is situated 4 miles east of Vegetable Creek. Many of the creeks and flats have turned out rich in tin, and at one time supported a population of about 200 miners, but most of the gullies having shallow stripping, the best deposits of tin bearing wash were very hurriedly worked, with but primitive appliances, and I have no doubt that if a good supply of water could be brought on to the gullies and flats here, they would all be re-worked profitably. At present a very small population is located here, who seem to be making a fair living by working some of the gullies and stacking the dirt, waiting for a heavy fall of rain.

On the north side of Tent Hill Creek is a granite range, which traverses the district in a north-east and south-west direction. On the summit of this range, there is a massive outcrop of a strong lode, traceable for some 3 miles, the width varies from 2 to 7 feet, and tin ore is found in many places along the line of the lode in quartz and iron stone.

M'Master's Lode, Tent Hill.

On the property known as M'Master's, consisting of 260 acres (close to Tent Hill) on the continuation of the same range, a very large outcrop occurs, which has been laid open, showing a strong quartz lode of excellent tin-bearing stone. The whole surface of the range on both sides tin can be found. Judging from the strength of this lode there is every indication that it is the champion lode of this district.

About 300 yards lower down the south side of the main range, on a table topped ridge, a lode was found, traceable on the surface about 150 yards in length, and 2 feet in width, on which a shaft has been sunk 9 feet deep, also a trench cut along it 6 feet and 2 feet in depth, from both shaft and trench large blocks of tin bearing stone have been thrown out very rich in tin ore, most of which has been burnt and pulverized by most crude appliances by a party of tributors, and I believe proved profitable. I may here remark, that there are two small creeks or gullies on the side of this range which empty into the main creek (Tent Hill), and each has been worked for stream tin, a large quantity having been raised from them; also large solid lumps of tin ore having been found, weighing up to 20 lbs.

The prospects of the company are such as to hold out every inducement to enterprising capitalists for investment. The natural features of the country present great facilities for the erection of a dressing plant, and the supply of timber for mining purposes is everything that could be desired.

Lewis and Griffith's Lode.

Another lode situated near that above-mentioned, on which some little labour has been expended, is that of Lewis and Griffiths; at present no work is being done on this lode, although the shaft is sunk to a depth of 42 feet, and the lode from the surface has gradually improved, being now well defined, 18 inches wide, and producing good tin-bearing stone, throughout. These prospects demand a fair trial.

Grampian Hills.

Another part of this district where tin lodes have of late been discovered, is the Grampians, the property of Messrs. Hall Bros. & Co., consisting of 1,000 acres under conditional purchase, and situated 6 miles north-west of Vegetable Creek. Most of the gullies rising from the high range in this property have been worked to considerable advantage for stream tin, and as very large lumps of tin in quartz were sluiced out of them, the spirited managing partner, Mr. J. W. Hall, was induced to prospect for the lode, the source whence these blocks must have been detached. On the top of the main range, which is about 600 feet (by aneroid) below the Vegetable Creek; the formation is feldspathic and thickly impregnated with tin ore, and is also a complete net-work of veins varying in width from $\frac{1}{4}$ to $2\frac{1}{2}$ inches of quartz and tin ore, and many are a compact mass of crystals of tin ore only. Associated with these faces of tin are, topaz and mispickel; a lode of the latter is situated on the south side of the range and contains tin-bearing stone 2 feet wide. On the same side of this range, being towards Vegetable Creek, are numerous low ridges on which the outcrop of lodes have been found of

late, large rock-veined stones were also found weighing from 1 lb. to 1 cwt., which would assay from 8 to 20 per cent. of ore. Some of these stones were of a very remarkable character, composed of mispickel, wolfram, and tin ore, and others are almost pure tin, with cavities. In several of these cavities are loose pieces of fluor spar. Again, there is another lode cropping out on the surface, some 5 feet wide, which is composed principally of fluor spar, a little quartz, schorl, and tin ore. A shaft has been sunk on the probable continuation of this lode some half a mile distant north-easterly. On the surface the lode was composed of mispickel, quartz, and a little tin; at a depth of about 20 feet some good stones of chalcopryite were found, and the lode 4 feet wide contained tin ore, mispickel, chalcopryite, ernbesite, purple copper, copper glance, chessylite (blue carbonate), and brown iron ore. At a depth of 30 feet the lode produced tin ore, copper ores, galena, and mispickel. At this depth the lode is well defined, having a bearing of about east 40 degrees north. The rock in which the lode occurs requires the use of blasting powder, and as none of it can be obtained up here this shaft has been temporarily abandoned till some arrives from Sydney.

At present the manager has hit upon the continuation of this lode further up the hill, where stone extremely rich has been found, and if the lode continues as rich at a depth, the proprietors may consider their energy and perseverance in prospecting for payable lodes, well rewarded. The surfacing all over this range is payable for tin, and it would only require a large head of stamps and permanent supply of water to make the Grampians one of the, if not the richest tin producing property in New England.

Gulf Creek.

At the Gulf Creek, situated 18 miles north of Vegetable Creek, some very promising lodes have been found, from some of which a considerable quantity of tin has been taken by working the loose portions of the reefs. None of them have been tried to a depth of more than 6 or 7 feet, although some of the lodes have every appearance of being permanent, and offer very good inducement for the employment of capital in developing them. Want of means has been the chief drawback to the working miner, and all the land has been taken up with one or two exceptions, by persons of small capital. The operations have chiefly been retarded by the want of water, the country being for the most part of such a broken character as to preclude the working miner with limited capital from bringing a permanent supply to the various workings. This portion of the tin mines has been worked for about three years, and during the earlier part of this period, supported a population of 150 persons. Owing to the present low price of tin, only half that number have remained. There is some difficulty in ascertaining the exact quantity of tin sent away, as it has passed for the most part through private hands, but from what I can learn, the total amount of ore raised up to the present time, is from 150 to 200 tons. It has been chiefly obtained by alluvial mining, the depth of of sinking varying from a few inches to 12 or 13 feet.

In one instance, on Messrs. Hetherington and Key's land, nuggets varying from a few ounces to 80lbs. weight were obtained in considerable quantities, at a depth of 5 or 6 inches from the surface.

The sluice box and fork is the only method here employed for washing dirt, and there is no doubt if proper machinery were placed on the ground it could be worked with far more profit and advantage to the miner. One of the greatest drawbacks to the development of the Gulf hitherto, has been the bad state of the road to it from Wellington Vale, this by a small outlay could be put in passable order, and I have not the least doubt that when it is done, the Gulf will command a much larger share of attention than has hitherto been its lot, and will, especially in its lodes, prove a profitable field for the investment of capital.

Timbarra and Mann Rivers.

On the dividing range between Timbarra and Mann Rivers several excellent tin lodes have been discovered. Very rich stream tin has been obtained on both sides of this range, but no work is being done on any of the lodes, although the prospects I understand are everything that can be desired.

Severn River and Dundee.

The head of the Severn River and Hogue's Creek, near Dundee, have yielded a very fair share of stream tin. It is found in the Nine-mile Creek, Glen Elgin, and Bracker's Gully, near Dundee, but most of the operations on this part of the mines have entirely ceased on account of the difficulty the miners have to contend with in working the ground along the River Severn, expensive machinery being required to pump the tin bearing lands dry, so as to admit of their being worked with any profit.

From the numerous reports given above, it will be seen that the country around Vegetable Creek is a vast tin field, one, it may be confidently said, which will not be exhausted for years. The price of tin is, I hope, not likely to fall much lower, and it is certain that should the market rise double the quantity now got can be obtained.

THE total yield of Tin from the Vegetable Creek mines, for the year ending 31st December 1875.

Name of Mine.	Locality.	Amount.
		Tons.
Vegetable Creek T. M. Co., (Ld.)	Vegetable Creek	740
Moore & Speare	"	450
Great Britain	"	430
Baalgammon	"	180
Little Wonder	"	139
Nonpareil	"	122
Rothschild	"	115
Little Britain	"	105
Cubis's	"	80
Hall Bros. & Co.	"	80
Grampians	"	40
Six-mile	"	60
Gordon	"	80
Tent Hill	"	69
Y Waterholes Creek	"	80
Gulf Creek	"	75
Tableland	"	100
Glen Creek	"	50
Surface Hill	"	30
Rocky Creek	"	15
	TOTAL	3,040

NEW ENGLAND AND CLARENCE DISTRICT.—GLEN INNES DIVISION.

(*W. C. Rogerson, Mining Registrar.*)

GLEN INNES is officially and commercially the centre of a mining district, which commences at Hogue's Creek, on the Northern Road, 18 miles distant from Glen Innes, and extends in a southerly direction to Oban, distant south-easterly from Glen Innes 30 miles, embracing Skeleton Creek, the head waters of the Severn, Glen Elgin, Kingsgate, the Gulf, Oakwood, the Mitchell River, and Mount Mitchell, whilst on the west metals have been found and worked in the neighbourhood of Wellingrove, and to within 4 miles of Glen Innes.

At the first-named place, viz., Hogue's Creek, tin mining was first commenced in the year 1872, and at present there are about a dozen miners on the ground, who are principally working under mineral leases.

On the upper waters of the Severn scattered parties are occupied in tin mining over an area of several miles ; but, so far as I can ascertain, very little ore is being raised there.

Skeleton Creek, though wholly taken up under mineral lease, is not at present being worked.

Glen Elgin Gold Field, situate 28 miles nearly due east of Glen Innes, has been open about 20 years, during the whole of which time it has been continuously worked by a few miners not numbering more at any time than about fifty, who are employed searching for gold in the alluvial.

With regard to gold mining, I have to report that at a place called Butterleaf Flat, about 4 miles from Glen Elgin, a party of men are employed in sinking a shaft for gold, and from prospects obtained on the surface they anticipate finding a rich deposit of that metal.

At Kingsgate, 18 miles easterly from Glen Innes, indications of tin were found during the tin rush three years ago, and several mineral selections were taken up, some of which have since been converted into conditional purchases. I understand tin has been found only in the lode in this locality, but with the exception of slight prospecting on the surface these lodes have not been operated upon.

On the Mitchell tin has been found in varying quantities right to the head of the river, but I believe there are no miners at work there now.

At Oakwood and the Gulf, easterly from the Mitchell River, gold has been found in quartz reefs ; but although the indications are reported to be promising, the lodes are not being worked.

Oban has been worked for gold for about 20 years, and is still occupied by a scanty population, principally Chinese. At this place tin was first found in the New England District, and is yet to some extent raised there.

About 14 or 15 miles westward of Glen Innes, in the neighbourhood of Wellingrove, a lode was found which showed on the surface indications of copper, and when sunk upon to a depth of 14 feet a view of pure galena was met with and worked, but carriage of the ore to the coast being too expensive to allow of a profitable return, operations are at present in abeyance.

Tin has also been found at different places between Wellingrove and Glen Innes, the nearest spot being at Jurrachabad, about 4 miles distant, but not in sufficient quantities to attract labour to the ground.

No shaft has been sunk on any gold bearing reef in this district with the exception of a few holes on the reefs about Oakwood and the Gulf, which holes are reported to be about 9 feet in depth.

Since my appointment to the office of Mining Registrar I have not been able to acquire a sufficient knowledge of the localities referred to herein to qualify me to go further into details, but I shall endeavour by personal inspection before the date of my next report to gather material for a detailed account of the state and progress of mining in my division.

I have not been able as yet personally to visit the various mines throughout my division, but will do so before the expiry of the present quarter, in order that I may then be able to lay before you the fullest information as to the state and progress of mining in this district.

NEW ENGLAND AND CLARENCE DISTRICT.—LUNATIC DIVISION.

(*M. J. Synge, Mining Registrar.*)

On the table-land I notice an increase of the Chinese population, who are settling down to work the old alluvial. At Pretty Gully also a number of Europeans have returned from the Palmer. At Tooloom a considerable amount of work is going on. Two large races have been cut to bring water to sluice the old workings ; one of them a distance of 15 miles. There has also been a machine site applied for to pump some holes out supposed to contain large quantities of gold. At Lunatic and Perseverance some of the forfeited leases have been taken up by working miners, and are now being worked vigorously, and I am told a number are waiting to take up and work some leases expected to be forfeited. At Pretty Gully the men seem to be satisfied with the returns, as they are building themselves good houses.

NEW ENGLAND AND CLARENCE DISTRICT.—SOLFERINO DIVISION.

(Wm. Campbell, Mining Registrar.)

Alluvial.

THE alluvial workings on this gold field are at present confined to the beds of creeks and gullies; the principal, the "Ewingar" Creek (a shallow sandy creek intersected by granite bars), is situated about 8 miles in a northerly direction from Solferino. Some years ago it was worked for a distance of 4 miles along the course of the stream, and was very rich in some parts. It is now being worked in places for the second time.

One party of two men have brought up a tail-race a distance of 300 yards, by blasting through granite bars, and are now working old ground by putting everything, including old tailings, down to the bed rock, through sluice boxes. They informed me that at present they are getting from 2 to 3 ozs. gold per week. The gold is fine and "shotty." Storekeepers here give £3 12s. per oz. for it. Another party of four men are working in the same creek, about 1 mile lower down. They have constructed a substantial dam, cut flood-race 400 yards, tail-race 390 yards, and also erected a water-wheel and pump for bailing to enable them to work the bed of the creek, which they do by paddocking. The stripping (which they wheel away in barrows) is from 16 to 20 feet deep, through drift sand and gravel. The wash-dirt lies on a soft granite bottom, and varies from 6 inches to 2 feet deep, with a width of 30 feet. The wash contains large quantities of clear and smoky quartz crystals, also crystals, about the size of peas, of pyrites.

They are obtaining at present from 3 to 4 ozs. gold per week from this claim. The gold is valued here at £3 12s. per oz.

A number of creeks and gullies, covering an area of 6 miles, including Bulldog Creek, has been worked, but I cannot ascertain amount of gold won, the miners having gone elsewhere, as this ground can only be worked in very wet seasons.

Melara Scrub, 10 miles W. of Solferino.—This place was discovered some fifteen years ago, and at one time employed upwards of 500 miners. A small population has resided there continuously ever since. It is situated in the midst of a dense scrub, the surrounding country is very mountainous and of a granite formation.

The principal work done there has been surfacing, and an area of about 2 miles has been stripped, the depth varying as much as from 8 to 20 feet.

I have been informed that a party of four men obtained £1,500 each, worth of gold for four months labour, from this place. There are also a number of gullies and small creeks in the neighbourhood, which have been proved to be auriferous, large quantities of gold having been won from them. Many have been worked over for the second, and even third time. One of them, named the "Main Creek," six men are now employed in working over for the second time. It is a shallow sandy creek, with bed rock of soft granite. The method employed is of the most primitive kind, being merely long and narrow sluice boxes, set in the bed of the creek, into which they shovel the wash, &c.

They informed me they have won, on an average, 10 dwts. gold per week per man for the last three months, but during that time the water supply had been very short.

The gold is very fine, and worth here £3 13s. per oz.

There are several quartz reefs and veins in the vicinity. On one of which the "Union" a little work has been done—some quartz from this reef sent to Sydney for assay yielded at rate of 4 ozs. gold per ton, the shareholders have abandoned it for want of capital to erect crushing plant.

Other creeks and gullies within a radius of 15 miles of Solferino have been proved to be auriferous, but at present only a few parties are at work—with varying success.

Quartz.

The surrounding district for a radius of 15 or 20 miles is intersected by a complete network of quartz reefs and veins, the general direction of the principal reefs bearing E.N.E., and most of them contain a large percentage of iron pyrites.

During the mining excitement in the years 1872 and 1873, a great many people totally ignorant of quartz mining, came from the surrounding agricultural and pastoral districts—who took up numbers of the reefs, by registration and applications for leases. On the

largest number of them no work whatever has been done (being only taken for the purpose of selling out immediately). On others, shafts from 10 to 20 feet have been sunk and abandoned for want of capital, the Palmer River diggings has drawn away a large number of the practical mining population, and from other causes this place is now almost deserted, consequently it is almost impossible to obtain all the particulars enumerated (not being able to find exact localities). Of the 92 lines of reef applied for only 5 claims are at present being worked employing forty men.

Of the claims recently stopped for want of capital (or other causes) I annex list, with such particulars as I have been able to ascertain.

Method of operating.

Quartz, &c., crushed by either steam or water-power machinery, and run over quick-silvered copper plates, and ripples, blanketings operated on in amalgamating barrels, cleaning from boxes, &c., put through Berden pans; the yield of gold obtained from blanketings, &c., varies from 15 dwts., to 4 ozs. per ton. At "Lion" Reef, G.M. Co's. Works, tailings, &c., are stacked for oxydation.

Waste.

Very little precautions taken to save waste—the only two mines on which any waste in quantity has been saved, are the "Lion" Reef G. M. Co., and the "Reform" Co., the approximate quantity accumulated is 2,100 tons, viz., "Lion" Reef Co., 1,300—"Reform" Co., 600—"Lombardy" 100—"Band of Hope," Co., 100 tons:—(Total, 2,100 tons.)

The quantity of gold won, during the last three months, from alluvions, according to Bank and Mint Returns as per receipts from storekeepers, and from information from miners themselves, has been 175 ozs. at 72s. per oz.

Minerals other than Gold.

Copper—One lode situated 8 miles north-east of Solferino, shows a lode 18 inches wide on the surface; a shaft has been sunk 20 feet, and the width increased to 2 feet, a small quantity of ore from this lode assayed at the rate of 26 per cent. copper. Another lode about 6 miles east of Solferino, 600 acres selected, shaft 20 feet deep, lode 18 inches, dip south, bearing east and west, quantity assayed by Mort & Co., Sydney, yielded 56 per cent. copper; both lodges abandoned for want of capital.

Iron.

A number of iron lodges are situated in the vicinity of Solferino, one of which has an outcrop on surface 20 feet in width, bearing north and south.

Antimony.

Lode situated 11 miles south of Solferino, has an outcrop on surface 15 inches, bearing north and south. No work done on it.

NEW ENGLAND AND CLARENCE DISTRICT.—DALMORTON DIVISION.

(W. F. Poole, Mining Registrar.)

ALL claims in this division, except the Tower Hill Co., have ceased work. This Company has crushed 30 tons quartz, which yielded 17 ozs. They have now about 60 tons at grass, which looks well.

Several parties are out prospecting, but have not yet got anything payable. Most of the miners who have left this place have stated their intention of returning as soon as the leases are all issued.

NEW ENGLAND AND CLARENCE DISTRICT.—BALLINA DIVISION.

(Henry Bassman, Mining Registrar.)

THE mining in the division is along the sea beach, a distance of about 20 miles south and north of the Richmond River heads. The few men who are there are only working at intervals. After a heavy storm they are supposed to get then from $\frac{1}{2}$ oz. to 1 oz. per week each man for about a fortnight; they then go generally to some other employment until the next storm washes some gold up again; what quantity of gold they actually get I cannot ascertain, there is scarcely any sold here; I am informed they send it to Sydney privately. This state of things has been going on here for the last three years; there is no improvement.

GEOLOGICAL SURVEYOR'S REPORT.

REPORT OF PROGRESS OF THE GEOLOGICAL SURVEY, DURING THE YEAR 1875.

TO THE UNDER SECRETARY FOR MINES, &c., &c.

SIR,

I have the honor to submit, for your information, the following Report of Progress of the Geological Survey during the year 1875.

My appointment, which was held under the Minister for Lands, was transferred to the Department of the Minister for Mines on the 1st January, 1875. At that date, and until the end of March, I was engaged in the geological survey of Bowenfels, Hartley, Wallerawang, and Rydal Districts, embracing an area of about 160 square miles. Within this area are included all the coal mines at present worked in the Western Coal Fields, and the iron ore and limestone deposits of the Lithgow Valley Iron Company.

Mr. P. F. Adams, Surveyor General, from his extensive personal acquaintance with the geological features of the Colony, selected this locality for survey as one wherein might be worked out the geological connection between the Gold-bearing Silurian or Devonian Rocks and the overlying Coal Measures.

The necessity for this work I have referred to in my report on this district; suffice it to say here, that without an accurate knowledge of the nature and relative positions of the several formations, and this may be gained only by actual survey, it is impossible to obtain that definite and reliable information which is of value to science and for guidance in mining operations.

It was also considered that this part of the Western or Bowenfels District* deserved special attention, on account of its extensive mineral resources. For, being so favourably situated as it is for access by the Great Western Railway to and from the seaboard on the east, and the vast mineral and pastoral districts on the west, this district, we cannot doubt, will become one of considerable importance. By the extension of the railway into the gold and copper mining districts there will open an increasing demand for the coal, iron, and firebricks;

* Strictly speaking the term *western* is incorrectly applied to the Bowenfels district; for though on the western side of the Blue Mountains, this district is on the *eastern watershed*. The line of railway crosses the Dividing Range between Rydal and Wallerawang.

while the copper-smelting works at the coal mines will receive additional supplies of ore and regulus by the greater facilities of carriage thus afforded, and local enterprise will be stimulated.

The seams of coal are practically inexhaustible. Five collieries are now at work, the Bowenfels, Eskbank, Lithgow Valley, Vale of Clwydd, and Blackman's Flat Collieries. The first four of these are situated in proximity to each other in the Lithgow Valley; and the Great Western Railway runs through the midst of them. It is the lowest coal seam in the coal measures which is now worked in each colliery. The seam is from 8 to 11 feet thick, and in the Bowenfels and Lithgow Valley Collieries it is worked from its outcrop at the surface. It dips about 1 in 30 to the E. At the Eskbank and Vale of Clwydd Collieries, which are situated in that direction, the coal is worked from shafts; though at one part on the Eskbank Estate the seam also outcrops at the surface. The same seam of coal is worked at the Blackman's Flat Mine, on the Mudgee Road, some $9\frac{1}{2}$ miles north-west from Lithgow Valley, and about 4 miles from the Wallerawang Railway Station. The coal is here 6 feet thick; but at Coal Creek, $2\frac{1}{2}$ miles west on the Wallerawang Iron and Coal Company's Estate, it is 17 feet thick.

Professor Liversidge's report on the coal, giving analyses of samples from the mines, is herewith appended.

There are other seams of coal above that now being worked; one of these is from 15 feet thick, at Lithgow Valley, to over 30 feet thick, near the Marangaroo River, but it contains many clay-bands.

Interbedded with the coal measures are extensive beds of fire-clay, from which excellent firebricks are manufactured, and used at Eskbank, by the Lithgow Valley Iron Company, and at the Eskbank Copper Smelting Works.

The coal measures also contain four or five bands (from 2 to 18 inches thick) of clay ironstone, assaying up to 56 per cent. iron. This clayband ore is that at present so successfully smelted at the Lithgow Valley Iron Company's furnace, which was first charged on the 16th December. The constant working of our iron mines will indeed be a matter of congratulation to the Colony.

Several miles from Wallerawang there is abundance of marble limestone of the purest quality. Samples of this marble which I obtained dress well and take an excellent polish. It occurs within easy access to the Railway and may be got in blocks of any required size.

My survey also extends to the New South Wales Shale and Oil Company's Mine in Hartley Vale, where I measured the seam of the best kerosene shale or petroleum oil coal 3 feet 2 inches thick, besides nearly 2 feet of oil schist of poorer quality. The position of all these mineral deposits, together with descriptive notes, are shown on my map.

Many interesting and some new fossils, also rock specimens and minerals, were collected by myself and party.

By a section we measured from Mount Lambie to Mount Walker, the Devonian beds were ascertained to be not less than 10,000 feet thick. It is in the lower beds of this series that the magnetic iron and brown hæmatite deposits occur near Mount Lambie.

It is unnecessary for me however to enter into particulars in this progress report, they will be found in the report accompanying my map.

My examination of the district was commenced in the previous October, but owing to the inaccuracy of the only maps obtainable, and the consequent necessity of making traverse surveys, the progress of my work was much retarded. It is not that topographical surveys have not been made, but that the manner in which some of the old surveys were carried out in this rough mountainous country has precluded the possibility of compiling a map to represent the surveys as they exist on the ground. And this state of things must continue and be an ever-increasing source of annoyance and expense, both to the surveyor and the Government, until a trigonometrical survey be made the base of survey operations. The present rapid occupation and alienation of Crown Lands urgently requires that the trigonometrical survey of the Colony should be carried out as expeditiously as possible.

On the 12th of January I accompanied the Surveyor General and Mr. J. S. Farnell, M.L.A., then Minister for Lands, to Mount Lambie for the purpose of examining the summit as to its suitability for a trigonometrical station. This conspicuous hill, which was formerly cleared for the trigonometrical survey by the late Sir Thomas Mitchell, we found to be about 4,070 feet above sea level; from its commanding position it will form a very important station for observation.

On the following day, accompanied by the Rev. W. B. Clarke, M.A., and the Hon. Francis Lord, we inspected the iron and coal deposits, the survey of which was then being proceeded with. I may state that these gentlemen expressed their appreciation of the work I was engaged on.

During the progress of this survey 13,882 chains or 178½ miles of traverse were measured by myself and assistants—chiefly in defining the geological boundaries and the outcrop of the workable coal seams, and to fix the position of the limestone and iron ore deposits.

The heights of the principal hills have been ascertained by aneroid observations.

Over 1,250 specimens illustrative of the geology and mineral resources of the district were collected and forwarded to the Museum of the Department of Mines. Many of the fossil specimens are the finest yet discovered, and amongst them are several species believed to be new to science. Some of these, through the kindness of the Rev. W. B. Clarke, have been sent to Dr. Oldham, Director General of the Geological Survey of India, for examination by the Palæontologist of the Indian Survey, whose report on them I expect shortly to receive. Having completed the geological survey of this district, on the 2nd March I returned to Sydney. The preparation of my map was a work of considerable time, occupying almost as many months as it should have done weeks, owing to the inaccurate surveys before referred to, and the necessity of examining at the Surveyor General's Office nearly all the original plans of these surveys, from which I found it was impossible to make a correct compilation; but with the information afforded by my own traverse surveys I have, after much difficulty, compiled as accurate a map as I think it possible to make under the circumstances. The map is now in the hands of the lithographer, who has nearly completed his work.

From the Museum of the Department of Mines I assorted a collection of mineral ores and fossils characteristic of the geological formations of New South Wales for exposition at the last Annual Exhibition of the Agricultural Society, which opened on the 6th April, 1875. This collection comprised upwards of 1,000 specimens, brought together chiefly by the officers of the Mining Department, and supplemented by a few contributions from private sources, to which reference is made in my notes on the mineral exhibits published in the volume "*Mines and Mineral Statistics*." For this collection the Department of Mines was awarded the first prize.

On 14th April, I visited Mount Wilson in company with Mr. R. D. Fitzgerald, the Deputy Surveyor General, and Mr. Moore, the Director of the Botanic Gardens, who made an official inspection of the country about Mount Wilson for the purpose of determining the boundaries of a reserve for timber. We found that the rich soil which, at this high point in the Blue Mountains, supports such a luxuriant growth of vegetation, has resulted from the decomposition of basaltic trap, which has here burst through the *Upper Coal Measures* and *Hawkesbury Sandstones*, and in parts has overflowed them. This basalt appears to be of Upper Tertiary age, and is probably contemporaneous with some of the extensive basalt flows in the Western District. It contains abundance of *oligoclase* or *glassy feldspar*.

On the 14th May, I proceeded to examine the coal lands in the vicinity of Jamberoo and Kiama, the result of my examination has been already communicated to you in a special report.

When at Kiama I inspected the excavations then being made for the new docks. The rock excavated is a hard dense basalt which, on the west side of the harbour, is seen to pass under the *Lower Marine Coal Measures*. The lower beds of the coal measures consist of conglomerates containing pebbles and boulders derived from this basaltic trap, which is therefore older than the overlying sedimentary strata.

A short distance from the docks is the so-called "*Blow-hole*," which consists of a cavernous passage, 20 feet wide, 25 feet high, and 120 feet long, opening to the ocean at one (the eastern) end, and at the other by a funnel-shaped vertical pit. During an easterly gale the waves rush with great force up this passage and then being suddenly arrested at the end of it, the water is forced up the pit and spouted to a considerable height into the air. This "*Blow-hole*" has been formed by the action of the waves disintegrating and excavating a narrow dyke of basalt which traverses, in a direction N. 20° W., the older columnar basalt; the latter being of a hard nature has resisted the action of the water, while the softer dyke has been washed away.

The vicinity of Kiama has special interest for the geologist. On the west shore of the harbour we have the carboniferous marine beds resting on the older basalt; and in the bold cliffs facing the ocean are seen splendid sections showing several dykes of a newer trap cutting through both the older basalt and the carboniferous marine strata. The dyke at the "*Blow-hole*" is one of these dykes.

They probably indicate the "*pipes*" whence issued in a molten state the porphyritic trap which overlies the carboniferous beds. This trap attains a thickness of from 150 to 200 feet, and its well-defined columnar structure is grandly shown in the coast cliffs about 2 miles north

from Kiama* ; its black vertical columns stand in marked contrast with the lighter coloured nearly horizontal strata underneath. This upper basalt varies very much in its lithological character ; in places it passes into greenstone, felspar porphyry, amygdaloid, and sometimes into an almost pure siliceous rock resembling quartzite, but with crystals of felspar distinctly traceable in it.

Immediately overlying this porphyritic basalt are the Upper Coal Measures with their extensive seams of coal—the equivalents of the seams now being worked at Bulli, Mount Pleasant, and Mount Keira near Wollongong.

The Upper Coal Measures in the Jamberoo District are from 500 to 800 feet thick, and are overlaid by the Hawkesbury Rocks from 200 to 400 feet in thickness, which between Jamberoo and Broughton Vale form a table-topped range called the "Saddle-back Mountain," having an undulating surface about 2,000 feet above sea-level. From this range to the coast, we have thus presented to us an interesting geological section, showing in descending order the following formations :—

Hawkesbury Rocks.

Upper Coal Measures.

Porphyritic Basalt, Greenstone, &c.

Coal Measures. (Marine Beds).

Basaltic trap.

During August and September I was prevented from active work by a severe attack of bronchitis. But for this illness, I was about to undertake, as you directed, a geological examination of the Lachlan District, for the purpose, among others, of getting further information as to the direction and extension to the westward of the auriferous deep leads, and also of reporting on certain of the Reserves for Gold Fields as to the advisability of their cancellation or continued reservation.

This work I hope shortly to undertake, now that the collection of exhibits for the Philadelphia Exhibition is nearly completed. The geological and mineralogical collection to be exhibited by the Department of Mines will include 748 *labelled samples*, of which eight samples consist of coal ; the remainder of other minerals and fossils, numbering altogether about 900 specimens. The geological section of the collection will have special scientific interest, inasmuch as it will exhibit the chief of the characteristic fossils of the principal sedimentary formations ; and the mineral section cannot fail to impress the visitors at the Philadelphia Exhibition with the magnitude of the coal and other mineral resources of New South Wales. The greater part of this collection was lately arranged and exhibited at the Temperance Hall, Sydney, to afford the public an opportunity of inspecting the exhibits previous to their transmission to America.

The following table gives a statement of the value per ounce, description, and assays of the *gold* exhibits sent. The gold, consisting of 46 samples of about 2 ounces each, from various Gold Fields in the Northern, Southern, and Western districts of the Colony, was selected and assayed at the Royal Mint, Sydney.

* NOTE.—The illustration of *Basaltic columns, Coast of Illawarra, New South Wales*, in Dana's *Manual of Geology*, p. 108, is a sketch from one of these cliffs.

SAMPLES OF GOLD characteristic of the Gold Fields of New South Wales.

No.	Locality.	Description of Gold.	Weight of Sample.	Loss in Melting, % cent.	Gold and Silver in 1,000 parts, after Melting.		Value per Oz. after melting, at £3 17s. 10d. Standard.		
			Ozs.		Gold.	Silver.	£	s.	d.
692	WESTERN DISTRICT. Sofala	In fine scales, and coarse plates and grains	2'50	1'54	923'0	72	3	18	9½
693	Bathurst	Fine scales and coarse grains, with some spongy and stringy	2'00	2'00	923'5	71	3	18	10
694	Do.	Fine scales, plates, and coarse grains...	2'00	1'47	918'0	76	3	18	4½
695	Hargraves	Fine dust and coarse grains	2'00	2'23	920'5	70	3	18	6½
696	Do.	Scaly, with some grains	2'00	1'15	961'0	33	4	1	9½
697	Tambaroora	Fine and coarse, scaly, and grains.....	2'00	1'31	940'0	54	4	0	1
698	Do.	Fine scales and grains	2'00	1'55	943'5	50	4	0	5
699	Do.	Reef gold, reticulated	2'00	2'77	944'5	51	4	0	6
700	Do.	Coarse waterworn grains or nuggets ...	2'53	2'00	935'5	54	3	19	8½
701	Hill End	Fine dust and coarse grains	2'00	2'47	945'5	47	4	0	7
702	Do.	Scaly, with coarse spongy grains	2'00	1'41	945'5	50	4	0	7
703	Do.	Fine scales, and coarse crystalline gold	2'00	2'18	947'0	47	4	0	8½
704	Do.	Scaly, and coarse filiform gold	2'00	1'97	942'5	49	4	0	4
705	Mudgee	Fine scales and coarse grains	2'50	1'93	941'0	56	4	0	2½
706	Do.	Coarse grains, with some scales	2'00	2'04	926'0	68	3	19	0
707	Do.	Fine and coarse scales	2'00	1'77	937'0	58	3	19	10½
708	Gulgong	Coarse spongy grains and some scales	2'00	1'78	938'0	58	3	19	11½
709	Do.	Dust and coarse scales	2'00	1'78	916'5	79	3	18	3
710	Do.	Coarse pieces, filiform and spongy.....	2'00	1'78	925'0	70	3	18	11
711	Do.	Scaly, with some grains	2'00	1'59	946'0	48	4	0	7½
712	Carcoar	Fine scales, very porous, with some magnetic iron	2'00	10'92	878'0	119	3	15	2
713	Do.	Fine and coarse filiform gold of a dark colour	2'00	2'94	960'0	36	4	1	8½
714	Orange	Scaly	2'00	2'67	943'0	51	4	0	4½
715	Do.	Fine dust—"Gunpowder gold".....	2'00	2'53	930'5	62	3	19	4
716	Stony Creek	Scaly	2'00	1'56	942'0	54	4	0	3½
	SOUTHERN DISTRICT.								
717	Braidwood	Plates and fine scaly	2'00	1'79	959'0	34	4	1	7½
718	Araluen	Fine dust—"Gunpowder gold".....	2'00	2'19	951'5	42	4	1	0½
719	Adelong	Fine scaly and coarse filiform	2'00	2'63	944'0	52	4	0	5½
720	Do.	Scaly	2'00	1'27	941'0	53	4	0	2
721	Do.	Coarse filiform with some scaly	2'50	1'69	946'0	50	4	0	7½
722	Tumut	Fine and coarse, some very spongy ...	2'00	6'28	927'5	70	3	19	1½
723	Young	Scaly dust gold	2'00	2'39	957'0	36	4	1	5½
724	Do.	Fine dust—"Gunpowder gold".....	2'00	1'52	943'0	49	4	0	4½
725	Nerrigundah	Strings, scales, and plates	2'50	1'64	980'5	15	4	3	4½
726	Kiandra	Scales and plates, with some grains and threads	2'00	3'15	927'0	63	3	19	1
727	Goulburn	Coarse grains and reticulated	2'00	6'87	975'0	22	4	2	11½
728	Bombala	Very fine scaly dust—"Gunpowder gold"	2'00	2'63	963'0	34	4	1	11½
729	Cooma	Filiform, crystalline, and some scaly...	2'00	3'17	938'0	56	3	19	11½
730	Do.	Filiform, crystalline, and some scaly...	2'00	4'22	924'0	70	3	18	10
	NORTHERN DISTRICT.								
731	Nundle	Fine scaly and coarse filiform	2'00	3'33	919'5	73	3	18	6
732	Do.	Scales, plates, and coarse filiform, of a brownish colour	2'00	3'28	902'5	90	3	17	1½
733	Tamworth	Spongy, filiform, and crystalline; some with a little quartz attached	2'00	3'28	912'0	83	3	17	10½
734	Do.	Do. do. do. do.	2'00	3'31	914'0	80	3	18	0½
735	Do.	Fine dust and shotty grains	2'00	3'31	899'5	93	3	16	10½
736	Armidale	Scales, with some threads	2'00	3'30	948'0	44	4	0	9
737	Do.	Fine scales	2'00	1'91	888'5	105	3	16	0

The results of the above assays are interesting and important, as maintaining the statement of Professor J. D. Dana that "the average proportion of gold in the native gold of California, as derived from assays of several hundred millions of dollars worth, is 880 thousandths; while the range is mostly between 870 and 890 (Prof. J. C. Booth, of U. S. Mint, in a letter to the author, of May, 1867). The range in the metal of Australia is mostly between 900 and 960, with an average of 925." Our present assays show even a higher average of 935.5.

It will also be seen from the tables that the value per ounce ranges from £3 15s. 2d. up to as high as £4 3s. 4½d.; no less than twenty-four of the samples being over £4, and eighteen over £3 17s. 10d. per ounce; the average value per ounce of the forty-six samples being £3 19s. 9d.

I have also been engaged with arrangement of the new Mining and Geological Museum of the Department of Mines, but the delay in obtaining the requisite cases and fittings, together with the preparations for the Philadelphia Exhibition, have hitherto prevented me from getting the minerals and fossils classified. The cases are now being fitted up, so that we hope very shortly to have all arrangements completed. When this is done, our present collection will form the nucleus of one from which may be derived reliable information respecting the mineralogy and geology of the Colony.

Upwards of 2,500 specimens have already been brought together by the Geological Survey party, the Examiner of Coal Fields, the Wardens, Mining Registrars, and other officers of the Department, whom you have instructed to forward specimens from their several districts. Amongst others received is a valuable collection of tin ores sent by Mr. Gower, Mining Registrar, which contains a remarkably fine specimen of stanniferous wash from the Vegetable Creek Tin Mine (O'Daly's); also some fossil leaves, indicative of the *Miocene Period*, from the clays and gravels of the tin-bearing beds of New England. Mr. Warden Dalton has sent some rich samples of auriferous wash-dirt from the deep leads in the Parkes district. Mr. Warden De Boos has forwarded specimens of auriferous quartz, illustrative of some of the reefs in the Southern district. Contributions of specimens to the Department of Mines have also been received from private sources. The following is a list of the contributors:—

Messrs. Beilby & Scott	Specimen of lode tin in granite, from the Bolitho Tin Mine.
Mr. Quong Tait	Samples of Quartz, with gold, from Lady Belmore Line of Reef, Braidwood.
Mr. Thomas Carpenter, O.E.	Crystallized and Grain Tin, and Tin Slag, from the Pyrmont Tin Smelting Works, Sydney.
Mr. J. M. Butchart	Specimens of Cassiterite (Wood-tin), from the Gulf, Beardsley Falls.
Mr. Rees	Carbonates of Copper from Copabella, Southern District; Impure Graphite from same locality; and Antimony from Wallerawang.
Mr. J. Chiplin	Green Carbonate, Grey and Yellow Sulphides of Copper from 3-mile Flat, 4 miles north of Wellington; also samples of Pyritous Quartz from Mitchell's Creek, County of Lincoln.
Mr. John Deer	Green and blue Carbonates, yellow Sulphide, and red Oxide of Copper, from Frog's-hole, Parish of Bala, County of King.
Mr. W. Bryant.....	Carbonates and Sulphides of Copper, with Galena, from the Cow Flat Copper Mine, near Bathurst.

Mr. C. R. Darton	Samples of native or virgin Copper, grey and yellow Sulphide, green and blue Carbonates, and red and black Oxides of Copper, assaying from 25 to 40·4 per cent. Copper, from the Belara Copper Mine, 20 miles from Gulgong.
Mr. Thos. Taylor	Green and blue Carbonates of Copper, red Oxide and Native Copper, and yellow Sulphides of Copper, from Peelwood, 10 miles from Tuena.
Mr. Gustavus Lett	Yellow Sulphide and green and blue Carbonates of Copper, from Mitchell's Creek, County of Lincoln.
The Hon. Francis Lord, M.L.C.	Specimen of Nickel Ore, Noumelle, from New Caledonia.
Mr. Alderman J. R. Steel	Specimen of Nickel Ore, Garnierite, from New Caledonia.
The Hon. John Lucas, M.L.A., Minister for Mines	Specimens of Antimony from Pyramul; Calcite, from Fish River Caves; Stalactite, from Fish River Caves; also Lower Marine Coal Measures Fossils from Wollongong; Cinnabar from Oudgegong; and Limonite from Lithgow Valley.
Mr. J. B. North	Copper Ores from Belara, and Kerosene Shale from Joadja Creek, Berrima
Messrs. Gilchrist & Weston	Sulphides of Copper from the Ophir Copper Mine.
Mr. J. De V. Lamb & Mr. J. Brown	Kerosene Shale from their property at Joadja, near Berrima.
Dr. Morgan	Gold in slate, from "Sandstone Reef," Cowarbee.
Mr. W. B. Simpson, L.S.	Carbonates of Copper from the Wellington District, and Silurian Fossils from the same district.
Mr. C. O. Helm	Amononite showing section of Septa.
Mr. James Daw	Gold in quartz from Courts' 4-acre lease, Hawkin's Hill View.
Mr. W. O'Halloran	Opalised wood, from Bloomfield, near Orange.
Mr. Hagarty	Auriferous Quartz, from Hill End.
Mr. James Jackson	Asbestos, from Wentworth, Lucknow Goldfield.
Mr. Seymour C. Stewart, J.P.	Gold in quartz, from Adelong.
Mr. George Hulks	Talcose Schist, from near Bathurst.
Mr. L. E. Johnstone	Gold in quartz, from Crudine Creek.
Captain Armstrong, R.N.	Specimens of various Copper Ores—Carbonates, Sulphides, and Red Oxide, from the Armstrong Copper Mine; also Carbonates, Sulphides, and Red and Black Oxides of Copper, from South Wiseman's Creek Copper Mine, near Bathurst.
Mr. H. A. Thompson	Ingot of Copper, and some Metallic Copper extracted by Hunt and Douglass' new Process, and Sulphides of Copper from the Goodrich Copper Mine; also samples of Stream Tin from the Wylie and Ruby Creeks Tin Mines; and ingot of Tin smelted from the same ores at the St. Leonards Tin Smelting Works.
Mr. J. Nancarrow, Manager of J. Young's Steam Marble Works.	Tiles of polished Colonial Marbles, from Marulan and Cow Flat; also one tile of marble from Six Island, off coast of Queensland.
Lithgow Valley Iron Co.	A bar of Pig Iron, the produce of the first smelting at the Lithgow Valley Iron Company's new Works, at Eskbank.
Mr. R. D. Adams	Large specimens of Galena, from Mylora, near Yass.
Mr. James Jones	Sulphide and Carbonate of Copper, from Jones's Mount, Tuena.
Rev. W. B. Clarke, M.A., F.G.S., &c., Branthwaite, St. Leonards.	Devonian Fossils, Spirifer and Rhynchonella, from the Gulf, Turon River; broken Auriferous Granite, from the County of Clive; and Tertiary Auriferous Cement with Silicate of Iron, from Two-mile Flat, Cudgegong River.
Mr. John Hume, Forest Lodge	Devonian Fossils—Lepidodendron and Spirifer—from range 10 miles north of Goulburn.
Mr. Thomas Brown, M.L.A., Eak Bank	Five large samples of Coal, with a section taken from the Coal Seam worked in the Western District, showing its actual thickness of 10 ft. 6 in.; also various other minerals from Capertee, Castlereagh River, &c.
Mr. W. Macleay, F.L.S.	Samples of rocks, &c., from New Guinea and adjacent Islands, collected by Mr. W. Macleay during his recent expedition. These specimens are specially interesting, as being the first Marine Miocene Tertiary Fossils discovered north of Cape Howe, and of the existence of which this is the first notice given.

In accordance with your instructions I made up and dispatched, on the 23rd February, for M. Simon, Consul for France, a collection of fossil and mineral specimens for transmission to the School of Mines, Paris. This collection, though necessarily small owing to the recent establishment of the geological survey, yet contains some of the most characteristic fossils of the geological formations of New South Wales. It is proposed to supplement these with other contributions from time to time as the Museum of the Department will admit of it.

In February Mr. E. Farr, then Mining Registrar at Bathurst, forwarded to this department some specimens of fossil fruit, found at a depth of 110 feet under basalt at Beneree. These I at once submitted to Baron von Müller, C.M.G., M.D., Ph. D., F.R.S., and L.S., Government Botanist of Victoria, &c., whose description of the Tertiary fossil plants, published by the Department of Mines, Victoria, has so largely added to our knowledge of Australian fossil botany. Baron von Müller informed me that on examining our specimens he discovered a new genus of plant, which he has designated *Rhytidocaryon*; while the other fossils he identified as belonging to species already described from the *Pliocene* Tertiary deep leads of Victoria. The Baron also very kindly favoured me with a full diagnosis of our fossils, which is herewith appended, accompanied by lithograms from drawings admirably executed on stone by Mr. Arthur J. Stopps, of the Surveyor General's Department.

During the year, 119 samples of the more important metallic ores and coals from our Museum have been submitted to Professor Liversidge, University of Sydney, for analysis. These comprise sixteen samples of coal, characteristic of the seams of coal worked in the various coal fields of the Colony; twenty-four samples of copper ores; sixty-seven samples of auriferous and stanniferous tailings and waste products; besides samples of antimony ore, iron ore, auriferous quartz, &c. Professor Liversidge's report, I am informed, you will shortly receive.

I have, &c.,

C. S. WILKINSON.

APPENDIX.

DESCRIPTION OF FOSSIL PLANTS FROM THE UPPER TERTIARY
AURIFEROUS DRIFTS OF NEW SOUTH WALES.

By Baron FERD. von MÜELLER, C.M.G., Ph.D., M.D., F.R.S., Government Botanist of Victoria.

RHYTIDOCARYON—F. von MÜELLER.

Fruit, spherical or slightly ovate, not distinctly dehiscent, one-seeded, with an oblique basal or slightly lateral attachment, woody or bony, externally wrinkled and somewhat tuberculate. Septum large, placenta-like, erect or slightly ascending from the bottom of the cavity, consisting of two portions, which are smooth, turgid, oblique, ovate, or sometimes broadly clavate or roundish, always more or less contracted at the base, mutually connate at the middle, rounded at the edges, broadly adnate to the lateral parts of the cavity, free from its summit. Seed cylindrical, bent around the placental or septal protrusion, oblique orbicular or ovate hippocrepical in outline, with a marginal furrow. Testa, thin, brittle, smooth.

RHYTIDOCARYON WILKINSONII.—PLATE I., FIGS. 1, 2, 3.

Beneree, under basalt, at a depth of 110 feet; Mr. Edward Farr; communicated by Mr. C. S. Wilkinson. Found also between Carcoar and Orange, by the Rev. W. B. Clarke, M.A. Fruits, which constituted probably separate carpels of a tricocous fructification from two-thirds to rather above 1 inch long, externally uneven from somewhat irregular slightly concentric ridges, which are often broken up into short tubercles, approaching in roughness somewhat to those of *Phymatocaryon Mackayi*, probably covered originally by a pulpy pericarp, which in decay would early perish, thus the nut-like covering constituting a putamen or endocarp; a very faint cleavage at the base, but no trace of valvular dehiscence; septal process from less than double to nearly triple the width of the walls of the endocarp, except the base and back free from the cavity. Seeds (in all specimens under examination) perished, but their form recognized from the space left for their reception between the dissepiment and the inner faces of the endocarp; remnants of the testa not showing any indications to intrusions into the albumen. The latter and the embryo unknown.

This new fossil, so far as I can judge from the material transmitted to me, brings before us for the first time with certainty a member of the *Menispermæ* among the vegetation of by-gone creations, inasmuch as of this order hitherto only the altogether doubtful genus *M'Clintockia* (*Heer die Fossile der Polarländer*, 114–116; *Schimper, Traité de Paléontologie Végétale*, III, 88–84, pl. XVIII) became palæontologically recorded. Unacquainted as we are with the flowers and the embryonic characters of the fruit, we must regard it unsafe to place this into any of the numerous genera of *Menispermæ*, distinguished mainly by their floral organization and the inner structure of their fruit; but the endocarp and septal protuberance show some resemblance to the South Asiatic genera *Hypserpa* (Miers, in *Annals of Natural History*, sic. ser. VII, 40), *Limacia*, and *Nephroica* (*Laureiro Flora Cochinchinensis*, 620 et 692), and the East Australian *Sarcopetalum* (F. M., *Plants indigenous to the Colony, Victoria I.*, 27, pl. III, Suppl.) The putamen, however, is more rough than that of any of these genera, and indeed conspicuously thicker than that of any living menispermaceous plant known to me, while in its great size the fruit of *Rhytidocaryon* shows only similarity (and in this respect merely) to *Hæmatocarpus* (Miers's *Contributions to Botany*, III, 324, t. 134). The leaves are unknown. It is probable that the plant yielding these fruits formed, like most of the menispermaceous order, a climbing shrub.

Plate I.

FIGS. 1, 2, 3, RHYTIDOCARYON WILKINSONII.

1 *a* Anterior view of fruit.

b Summit of fruit.

c Dorsal view.

Fig. 2 *a, b* Anterior and posterior views of larger fruit.

c Side view.

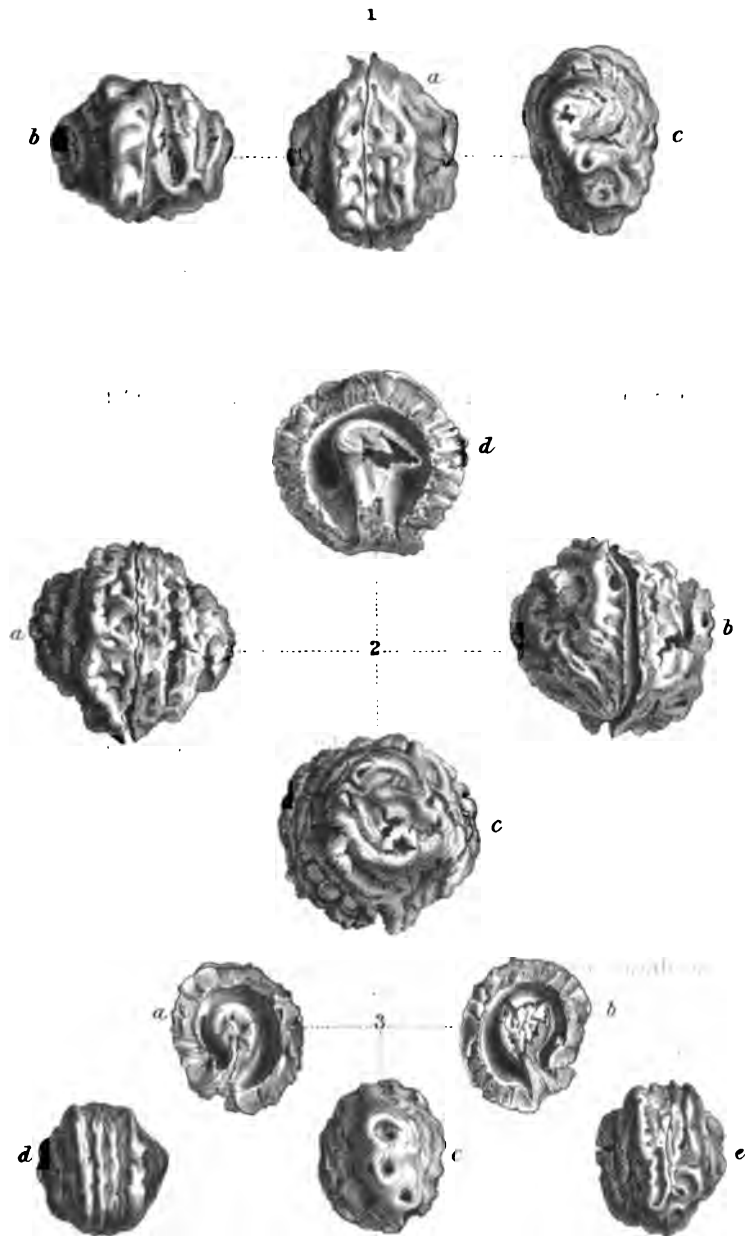
d Interior view exhibiting cavity and condyle.

Fig. 3 *a, b* Interior of smaller variety of fruit showing cavity and condyles.

c Side view.

d, e Anterior and posterior views.

Figures drawn according to natural dimensions.



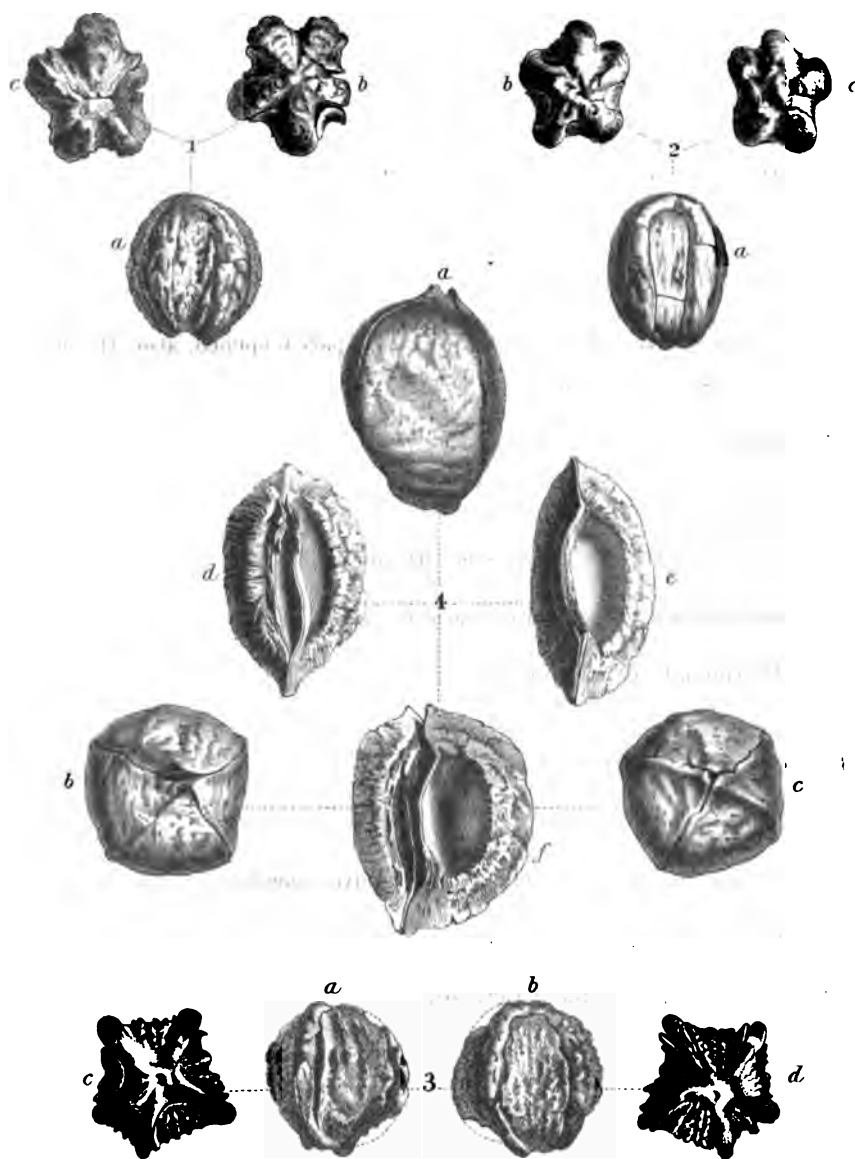


Plate II.

FIGS. 1, 2, 3, SPONDYLOSTROBUS SMYTHII.

1 *a* Side view of fruit.

b Base of fruit.

c Vertex of fruit, showing the five valves partly opened, also, the five dissipimental ridges.

Fig. 2 *a* Lateral view of an ovate variety.

b Its top, and

c Its base view, the surface somewhat abraded.

Fig. 3 *a, b* Lateral views of a spherical variety.

c, d Its summit and base in view.

FIG. 4.—PENTEUNE CLARKEI.

a Side view of fruit.

b, c Vertex and base presented of a four-valved variety.

d, e, f Inner side views of separated valves.

The figures are all drawn according to the natural size.

SPONDYLOSTROBUS—F. VON MUELLER.

[Strobilus woody, globose ovate or almost spherical, with five, rarely four or six, thick longitudinal ribs, forming as many blunt prominent dissepiments, consolidated in the axis of the fruit; these costæ at the vertex furrowed by single grooves. Base of the strobilus naked. Valves, five, rarely four or six, interjacent to the costæ, and by them widely separated from each other, erect, long appressed, fixed at the base, compressed-trigonal, the exterior face in outline oblong or lanceolar-oval, all nearly equal in size, and extending from the base of the fruit to about three-fourths its height, irregularly rough at the back, not keeled nor appendiculate. Cells, five, rarely four or six, each bearing a single seed towards the centre of the fruit. Seed ovate, nearly half as long as the valves, very convex at the inner side, winged around the whole margin, pendant from near the apex of the cavity, to which it is affixed, not always all developed.

I derive the generic name from *σπῶδουλος* (verticillus, whorl) and *στροβος* (strobos, pine cone).]*

SPONDYLOSTROBUS SMYTHII.—PLATE II., FIGS. 1, 2, 3.

The fruits of this tree are rather variable in size and shape, but preserve throughout a long series of varieties, the cardinal characteristics of this extinct genus of Coniferae, of which, as yet, but one species became known, described by me in Mr. R. Brough Smyth's "Reports of Mining Surveyors and Registrars for 1871." A short notice of this fossil appeared also in the "London Geologic Magazine" for March, 1871. We had this identical plant hitherto from Nintingbool, the Tangil, Beechworth, and also from Orange, in New South Wales, among pliocene drift. This tree must therefore have occupied a vast area of that period. As foliage of pine-like trees is preserved readily in a fossil state, we may succeed in discovering the leaves, and also get the flowers of this conifer, for which hitherto on other spots a search has been made in vain. This fossil, together with the *Pentameria Clarkei*, is indicative of auriferous strata.

[The validity of the genus rests chiefly on the extraordinary development of the columella, if so it may be called; this columellar portion forming indeed the main body of the fruit. In this respect *Spondylostrobus* differs from all other cupressineous genera, living as well as by-gone. It shares the normally five-valved structure of the fruit only with *Solenostrobus* (Endlicher, *Synopsis Coniferarum*, page 272, *Cupressinites*; Bowerbank, London Clay, partly), but, as explained already in the diagnosis, this character of the number of valves is not absolute, though predominant, and thus vindicating the generic value of *Solenostrobus*. The species of the latter genus are, however, very distinct from *Spondylostrobus*, should even the augmentation of material from new sources induce us hereafter to unite generically the new fossil now reviewed with *Solenostrobus*, Access to Bowerbank's illustrated work ("History of the Fossil Fruits and Seeds of the London Clay, 1840"), obligingly afforded me by my venerable friend the Rev. W. B. Clarke, the senior of Australian philosophers, proved beyond doubt that the enormous columellar receptacle of *Spondylostrobus*, on which the valves are sunk, is totally wanting in any of the four species of *Solenostrobus* figured. (Plate IX, figs. 22 and 23; also plate X, figs. 24 and 25; also figs. 28 and 29). These illustrations indeed show sufficiently that the margins of the fruit-valves are contiguous, precisely as in the existing genus *Callitris*, and its sub-genera *Frenela*, *Actinostrobus*, and *Octoclinis*; whereas in *Spondylostrobus* the fruit valves are rendered discontinuous by the intervening and protruding ridges of the receptacle. Excellent as Sowerby's drawings are, as furnished for Bowerbank's work, they give us no insight into the real inner structure of *Solenostrobus*, owing indeed to the scanty or imperfectly preserved material, not sufficient for examination, or too precious to be sacrificed in dissection. Another allied genus, *Passalostrobus* (Endl. *Syn. Conif.*, 278; *Cupressinites tessellatus*, Bowerb., Lond. Clay, page 53, plate X, figs. 26, 27, 30, 31), may perhaps indicate, in its structure, an approach to a columnar development beyond the summit, but not beyond the margins of the valves, should the central portion of the fruit be receptacular and not valvular. This the re-inspection of the original specimens can only explain. The doubts entertained by the learned Schimper in reference to the systematic position of *Solenostrobus*

* The paragraphs in brackets are extracts from "Observations on New Vegetable Fossils of the Auriferous Drifts, by Baron Ferd. von Mueller, C.M.G., &c.," published by the Victoria Mining Department.

(Conf. Schimper *Traité de Paléontologie Végétale*, tome seconde, 1870, page 358), are, by the discovery of our pentamerous conifer in Australia, now completely cleared away. Neither in his work, nor in Heer's still more recent elucidation of some fossil coniferæ (Philos. Transactions of the Royal Society of London, 1870, page 463, plate XL, figs. 10 and 11; also plate XLIII, figs. 4 and 5) are any additional plants recorded to shed light on the pentamerous coniferæ from Sheppy, as regards their foliage and seeds.

[In reference to the affinity of *Spondylostrobus* to existing coniferous plants, a comparison is possible only with *Callitris* and its sub-genera, because they alone exhibit likewise a simple verticillus of fruit valves. In all the species of that genus, the columella is comparatively small or obliterated, and therefore no obstacle offered to the contiguity of the fruit valves. The seeds, moreover, are never in number less than two located at each valve, often more in number, sometimes numerous, while the valves are four, six, or rarely eight in normal number, never five. Absence of flowers, leaves, and perfect seeds of *Spondylostrobus* prevent us from carrying the comparison further. There is no other genus, recorded in the recent elaborate essay on existing coniferæ of the whole globe, as furnished by my illustrious friend, Professor Parlatore, for De Candolle's *Prodromus* (pars xvi, 361-521) that could be regarded closely related to the fossil plant here under consideration.]

PENTEUNE—F. VON MÜELLER.

[Fruit five-valved to the base, ovate, globose, or broadly ovate; dehiscence loculicidal; valves exceedingly thick, woody, very slightly rough on the dorsal part. Cavity towards the middle part of the valves. Free central, axis absent. Cells five in number. Seeds solitary in each cell, towards their summit attached to the inner angles of the valves, turgid, ovate or verging into an ellipsoid form, blunt at the base, more gradually attenuated upwards. Testa smooth.

[The generic name, composed of *πεντε* and *εὐρη*, is chosen in allusion to the five valves on which the seeds are imbedded.]

No. 4 is the front of the *Penteune Clarkei*, also of this tree which was a companion of the *Strongylostrobus*, but seemingly less frequent than the latter, we have as yet neither flowers nor leaves.*

[In the absence of any other identified remnants of this doubtless arboreous plant, no positive systematic position can as yet be found for this genus. It belonged however most probably to Sapindaceæ, although the possibility of its having formed a genus of the Meliaceæ order is not excluded.]

[This conspicuous fossil is dedicated to the Rev. W. B. Clarke, M.A., F.R.G.S., F.G.S., F.Z.S., the nestor among Australian workers in the field of natural science, who amidst the arduous duties of his ecclesiastic calling has carried on with unabating enthusiasm his geologic researches in this continent for nearly half a century.]

[An externally very similar fossil has been discovered in Tasmania, by Morton Alport, Esq., at Gerlston Bay, in tertiary travertine. Some affinity of these fossils to the genus *Rhytidotheca* is evident from the number of the valves, the dehiscence and the single seed in each cell.]

* Fossils transmitted by the Rev. W. B. Clarke, along with *Rhytidocaryon Wilkinsonii*. *Penteune Clarkei* (variable in the size of its forms). *Phymatocaryon angulare* (with a bi-valved variety). In reference to *Spondylostrobus Saythii* may be added that it produces (though very rarely) a *tri-valved* variety.—F. v. M.

PROFESSOR LIVERSIDGE'S REPORTS.

REPORT

UPON CERTAIN OF THE

COALS, IRON ORES, LIMESTONES, AND
COPPER ORES.

OF

NEW SOUTH WALES.

BY

ARCHIBALD LIVERSIDGE,

PROFESSOR OF MINERALOGY IN THE UNIVERSITY OF SYDNEY, LATE SCHOLAR OF CHRIST'S COLLEGE,
CAMBRIDGE.

PART I.

NOTE.—The following pages contain the results of an investigation, made at the request of the Hon. J. Lucas, M.P., Minister for Mines, into the chemical composition of a number of samples of minerals, collected by the officers of the Mining Department, from some of the principal mines and mineral deposits in various parts of New South Wales. These specimens were submitted to me for examination, with special reference to their economic value, and it is therefore on that account that in most cases only the more important constituents have been estimated.

This first instalment contains the analysis of a number of coals, two or three iron ores, limestones, a series of copper ores, and a mineral, which, although of no intrinsic value, is of scientific interest.

ARCHIBALD LIVERSIDGE.

MINERALS OF NEW SOUTH WALES.

COALS.

NORTHERN DISTRICT.

No. 1.—Waratah Colliery.

A good firm, bright coal, with well-marked lines of lamination, bright layers preponderate. Fracture fairly even, breaking into cuboidal masses. Layers of fibrous “mineral-charcoal,” or “mother-of-coal,” in between the bright layers; these were also observed in nearly all the other coals.

Specific gravity, 1·303.

ANALYSIS.			
Moisture	...	...	2·21
Volatile Hydrocarbons	...	...	36·70
Fixed Carbon	...	...	55·82
Ash	...	...	4·15
Sulphur	...	...	1·12
			<hr/>
			100·00.
			<hr/>

 } Coke, 59·97 per cent.

Coke.—Good, firm, bright and silvery lustre, well swollen up, with small cauliflower-like excrescences.

Ash.—Loose and flocculent, reddish colour, rather paler than No. 7 coal from Australian Agricultural Company's Mine, Newcastle.

No. 3.—Anvil Creek.

Structure laminated but compact; not so much mother-of-coal present as in No. 1 (Waratah mine); breaks into cuboidal masses. Does not readily soil the fingers.

Specific gravity, 1·323.

ANALYSIS.

Moisture	1·74	} Coke, 55·70 per cent.
Volatile Hydrocarbons	...	...	41·10
Fixed Carbon	...	...	47·90
Ash	...	...	7·80
Sulphur	...	...	1·46
			<hr/> 100·00. <hr/>	

Coke.—Good, firm, bright silvery lustre, not much swollen up,

Ash.—White.

No. 4.—Russell's Mine.

Made up of alternate bright and dull laminæ, which merge one into the other irregularly, giving the coal a streaky appearance, quite distinct from the laminated appearance of coal made up of well-defined bright and dull layers. The bright layers have a very brilliant pitchy lustre. Fracture somewhat conchoidal. Does not soil the fingers.

Specific gravity, 1·274.

ANALYSIS.

Moisture	1·85	} Coke, 53·65 per cent.
Volatile Hydrocarbons	...	...	44·09
Fixed Carbon	...	...	49·95
Ash	...	...	2·70
Sulphur	...	...	1·41
			<hr/> 100·00 <hr/>	

Coke.—Good, firm, bright silvery lustre, with cauliflower-like excrescences.

Ash.—Loose; colour red, but paler than Waratah coal.

No. 5.—Greta.

Very similar to No. 1, but with less mother-of-coal; does not soil the fingers; streaky appearance. Fracture conchoidal across the layers.

Specific gravity, 1·287.

ANALYSIS.			
Moisture	...	...	2·25
Volatile Hydrocarbons	...	...	39·21
Fixed Carbon	...	...	54·41
Ash	...	...	2·72
Sulphur	...	...	1·41
			<hr/>
			100·00.
			<hr/>

Coke, 57·13 per cent.

Coke.—Good, firm, not quite so bright as the former, but rougher in the grain and more swollen up.

Ash.—Loose, buff coloured.

No. 6.—Wallsend.

A bright coal; laminated structure well marked; breaks into irregular cuboidal fragments. Does not soil the fingers readily. Contains a little fibrous mineral charcoal.

Specific gravity, 1·333.

ANALYSIS.			
Moisture	...	...	2·75
Volatile Hydrocarbons	...	...	34·17
Fixed Carbon	...	...	57·22
Ash	...	...	4·64
Sulphur	...	...	1·22
			<hr/>
			100·00
			<hr/>

Coke 61·86 per cent.

Coke.—Much the same as No. 5, but with large cauliflower-like excrescences.

Ash.—Of a pinkish shade, being white mixed with reddish particles.

No. 7.—Agricultural Company's Mine, Newcastle.

Very similar to No. 1, but a shade less bright. Breaks into irregular cuboidal fragments. Does not soil the fingers. Contains films of mineral charcoal.

Specific gravity, 1.297.

ANALYSIS.

Moisture	2.20	} Coke 62.87 per cent.
Volatile Hydrocarbons	...	...	...	32.60
Fixed Carbon	...	...	...	57.52
Ash	...	...	...	5.35
Sulphur	...	...	...	1.33
				<hr/> 100.00 <hr/>	

Coke.—A good firm Coke, like Nos. 5 and 6, but much more swollen up; very large cauliflower-like excrescences.

Ash.—Heavy, white.

WESTERN DISTRICT.**No. 8.—Bowenfells.**

Dull lustre, rather strongly laminated; laminæ of bright coal very thin. Does not soil the fingers. Fracture is in parts large conchoidal.

Specific gravity, 1.399.

ANALYSIS.

Moisture	...	...	...	2.36
Volatile Hydrocarbons	...	...	...	28.35
Fixed Carbon	...	...	...	56.54
Ash	...	...	...	11.40
Sulphur	...	...	...	1.35
				<hr/> 100.00 <hr/>

Coke.—Does not cake; a loose and incoherent black powder left.

Ash.—Dense; white.

No. 9.—Eskbank.

A good compact coal; soils the fingers; lustre dull; in parts laminæ not well defined.

Specific gravity, 1·335.

ANALYSIS.

Moisture	...	...	2·00	} Coke 62·88.
Volatile Hydrocarbons	...	...	33·55	
Fixed Carbon	...	...	49·97	
Ash	...	...	12·91	
Sulphur	...	...	1·57	
			<hr/> 100·00 <hr/>	

Coke.—Fair, but rather tender.

Ash.—Brilliant white colour.

No. 10.—Vale of Clywdd.

A good compact coal; rather bright on the whole, the bright layers being fairly numerous; fracture irregular; a fresh surface does not soil the fingers.

Specific gravity, 1·323.

ANALYSIS.

Moisture	...	...	2·10	} Coke 63·18 per cent.
Volatile Hydrocarbons	...	...	33·35	
Fixed Carbon	...	...	53·38	
Ash	...	...	9·80	
Sulphur	...	...	1·37	
			<hr/> 100·00 <hr/>	

Coke.—Hard, compact, and fairly lustrous.

Ash.—Very feeble grey tint.

No. 11.—Lithgow Valley.

Has much the appearance of No. 10, from the Vale of Clywdd. Does not soil the fingers.

Specific gravity, 2·329.

ANALYSIS.				Coke, 62·46 per cent.
Moisture	...	...	1·95
Volatile Hydrocarbons	34·18	
Fixed Carbon	52·34	
Ash	10·12	
Sulphur	1·41	
<hr/>				
100·00				
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Coke.—Hard, compact and fairly lustrous, about the same as the last.

Ash.—White in colour.

SOUTHERN DISTRICT.

No. 12.—Mount Kembla.

A coal of medium brightness, with laminated structure, breaking with a granular surface in places; splits readily along the planes of lamination. The bright layers are tender, and break into small pieces with conchoidal surfaces.

Specific gravity, 1·363.

ANALYSIS.			
Moisture	...	...	1·50
Volatile Hydrocarbons	...	...	19·74
Fixed Carbon...	...	...	67·18
Ash	...	...	10·72
Sulphur	...	...	·86
<hr/>			
100·00			
<hr/>			

Coke.—Coal does not cake, therefore no true coke formed, a dull black fritted mass left.

Ash.—Brilliant white colour.

No. 13.—Mount Keira Coal.

Possesses much the same characters as the last, only soils the fingers rather more readily.

Specific gravity, 1·379.

ANALYSIS.			
Moisture	...	...	1·15
Volatile Hydrocarbons	...	...	23·51
Fixed Carbon...	...	...	64·65
Ash	...	...	9·70
Sulphur	...	...	·99
			<hr/>
			100·00
			<hr/>

Coke, 74·35 per cent.

Coke.—Hard, fairly lustrous, and much swollen up, with cauliflower-like excrescences.

Ash.—Loose, brilliant white colour.

No. 14.—Berrima.

A good firm coal, but more tender than the others. The bright layers present in fair proportion.

Specific gravity, 1·364.

ANALYSIS.			
Moisture	...	...	1·70
Volatile Hydrocarbons	...	...	32·78
Fixed Carbon...	...	...	53·84
Ash	...	...	10·40
Sulphur	...	...	1·28
			<hr/>
			100·00
			<hr/>

Coke, 64·24 per cent.

Coke.—Bright and lustrous. Very much swollen up.

Ash.—White.

No. 15.—Dymock's Seam, Jamberoo.

A firm compact coal; bright and dull layers present in about equal proportion.

Specific gravity, 1·455.

ANALYSIS.			
Moisture	...	...	1·50
Volatile Hydrocarbons	...	...	20·22
Fixed Carbon...	...	...	56·56
Ash	...	...	20·70
Sulphur	...	...	1·02
			<hr/>
			100·00
			<hr/>

Coke.—Non-caking, therefore no true coke; a black powder merely left.

Ash.—Grey, small in bulk.

TABULAR VIEW OF THE PERCENTAGE COMPOSITION.

Northern District Coal-field.

I.

No.	Name of Colliery.	Moisture.	Volatile hydrocarbons.	Fixed carbon.	Ash.	Sulphur.	Sp. gr.	Coke.
4.	Russell's	1·84	44·09	49·95	2·70	1·41	1·274	52·65
5.	Greta	2·25	39·21	54·41	2·72	1·41	1·287	57·13
1.	Waratah	2·21	36·70	55·82	4·15	1·12	1·303	59·97
6.	Wallsend	2·75	34·17	57·22	4·64	1·22	1·333	61·86
7.	A. A. Co.'s Mine, Newcastle ...	2·20	32·60	57·52	5·35	1·33	1·297	62·87
3.	Anvil Creek	1·74	41·10	47·90	7·80	1·46	1·323	55·70

The coals in the above table are arranged in order, according to the amount of ash present, the first of the series containing the smallest, and the last the largest weight of ash. With the exception of the specimen from Anvil Creek it will be noticed that the proportion of fixed carbon increases with the increase in the amount of ash, the proportions of volatile hydrocarbons naturally undergo a corresponding diminution.

Speaking generally the coals which yield a large percentage of volatile hydrocarbons may be said to be the best adapted for the manufacture of gas.

It will also be at once apparent that the sp. gr. in most of the above cases affords a very good indication of the quality of the coal. As a general rule, ordinary coals which possess a high specific gravity, yield a large proportion of ash.

TABULAR VIEW OF THE PERCENTAGE COMPOSITION.

Western District.

II.

No.	Name of Colliery.	Moisture.	Volatile hydrocarbons.	Fixed carbon.	Ash.	Sulphur.	Sp. gr.	Coke.
10.	Vale of Clywdd	2·10	33·35	53·38	9·80	1·37	1·323	63·18
11.	Lithgow Valley	1·95	34·18	52·34	10·12	1·41	1·329	62·46
9.	Bowenfels	2·36	28·35	56·54	11·40	1·35	1·399	None.
8.	Eskbank	2·00	33·55	49·97	12·91	1·57	1·355	63·18

It is noticeable that the quantity of ash yielded by these Western coals is much greater than is yielded by the Northern ones, also that the specific gravity is in certain cases much higher.

The ash in all cases was white and dense, whereas many of the Northern coals yield ashes of a buff or red tint, and often quite loose and flocculent.

It is a common opinion amongst the non-scientific that the relative amounts of sulphur present in coals can be approximately estimated by the redness of the ash—on the supposition that the whole of the sulphur exists in the coal in the form of iron pyrites—but such is not the case; on referring to the analyses of the Northern District coals, it will be seen that some of the coals which left pure white coloured ashes contained the largest amount of sulphur, and that others which left red ashes contained the smallest quantity of sulphur.

Sulphur may be present in coals in various forms—either in combination with iron as pyrites which is the most common form of all—as sulphuric acid in combination with the inorganic constituents of the coal, such as alumina, lime, magnesia, or potash, or again, it may exist in the form of organic compounds.

**TABULAR VIEW OF THE PERCENTAGE COMPOSITION.
Southern District.**

III.

No.	Name of Colliery.	Moisture.	Volatile hydrocarbons.	Fixed carbon.	Ash.	Sulphur.	Sp. gr.	Coke.
13.	Mount Keira ..	1.15	23.51	64.65	9.70	.99	1.379	75.35
14.	Berrima.....	1.70	32.78	53.84	10.40	1.28	1.364	64.24
12.	Mount Kembla	1.50	19.74	67.18	10.72	.86	1.363	Non-coking
15.	Dymock's, Jam-beroo	1.50	20.22	56.56	20.70	1.02	1.456	Non-coking

The specific gravities of these coals do not in all cases bear that same close relation to the amount of ash which was seen in the case of the coals from the Northern District.

In order that an opinion may be formed with regard to the coals of New South Wales, it will perhaps not be amiss to compare them with some of those produced in various parts of Great Britain.

In the first place, the proportion of ash in a coal is a matter of the greatest importance; the value of coal as a fuel depends to a great extent upon the smallness of the quantity of non-combustible matter which it contains; if the amount be very large the coal will be perfectly worthless. Neither must the quality or chemical composition of the ash be neglected, for if the ashes be easily fusible, as they usually are, when a large quantity of iron is present, they tend to "clinker up" the grate, and thus cause great waste of heat, and the expenditure of much extra time and labour in stoking.

We have seen that the Northern District coals yield on the average the smallest amount of ash, which is from 2·70 per cent. to 7·80, with an average percentage of 4·57; the Western District coals range from 9·80 to 14·15, and average 11·05 per cent.; and the Southern District coals yield from 9·70 to 20·70 per cent., and average 12·88 per cent. ash.

PERCENTAGE OF ASH.

	Minimum.	Mean.	Maximum.
Northern Coal Fields, of six samples.....	2·70	4·57	7·80
Western " " four " 	9·80	11·05	12·91
Southern " " four " 	9·70	12·88	20·70

Now English Newcastle (Northumberland) coking coal contains from 0·79 to 2·49 per cent. ash (see Percy's Metallurgy, vol. 1, p. 99), and averages 1·68. The Nottinghamshire contains 3·9 per cent., and coal from Blaina, South Wales, averages 2·63 per cent. English non-coking coals run rather higher; thus S. Staffordshire coal varies from 1·555 to 6·44, and S. Wales from 1·20 to 7·18; Scotch coals from 1·43 to 6·75; so that, as far as the proportion of ash is concerned, some of our Northern coal is quite equal to the Welsh and Scotch coals, and but little inferior to the English Newcastle coal.

A matter to which we must pay careful attention is the proportion of sulphur present in a coal. The presence of a large amount of this element not only renders the use of the coal unpleasant for domestic purposes, but makes it useless for most manufacturing and metallurgical operations.

The quantity of sulphur existing in the New South Wales coals is by no means excessive, and they will in this respect compare not unfavourably with those of other countries.

PERCENTAGE OF SULPHUR.

	Minimum.	Mean.	Maximum.
Northern Coal Fields	1·12	1·35	1·56
Western „	1·35	1·42	1·57
Southern „	·86	1·06	1·28
Newcastle Coal (England)	·55	·97	1·51

(Vide Percy's Metallurgy, Vol. I.)

Playfair and De la Beche found, during their investigation for the English Government, that the mean percentage of sulphur was as follows :—

Welsh coal	1·42	per cent. sulphur
Derbyshire	1·01	„ „
Lancashire	1·42	„ „
Newcastle	0·94	„ „
Scotland	1·45	„ „

Most of the Secondary and Tertiary coals, on the other hand, contain a larger proportion of sulphur, usually two or three and sometimes as much as 5·0 or 6·0 per cent.

IRON ORES.

No. 16.—Brown Hæmatite. Manly, near Sydney.

This specimen of hydrated sesquioxide of iron possessed a somewhat laminated and concentric structure, with small vesicular cavities, many of which were filled with white and yellow clay-like substances.

Specific gravity, rather high.

	ANALYSIS.
Water-hygroscopic	1·600
„ combined	13·770
Silica and insoluble matter	12·660
Sesquioxide of iron... ..	60·720
Phosphorous	traces.
Sulphur	·075
Undetermined	11·175
	<hr/> 100·000 <hr/>

The 60·720 per cent. of sesquioxide of iron is equal to 42·504 of metallic iron. The undetermined constituents consisted chiefly of alumina, lime, &c. The amounts of sulphur and phosphorus are small.

No. 17.—Limonite. Eskbank.

A variety of brown hæmatite, commonly known as “clay band iron ore,” occurring interbedded with the coal measures. The masses often possess an irregular cuboidal form, and sometimes are seen to contain cavities, usually more or less filled with yellow ochre, and closely answering in shape to the external form.

ANALYSIS.

Water-hygroscopic ...	...	...	...	...	...	1·730
„ combined ...	...	...	...	...	...	13·560
Silica and insoluble matter	...	...	...	...	...	13·520
Sesquioxide of iron	...	...	...	...	...	66·320
Phosphorous	...	...	...	...	...	traces.
Sulphur ...	...	...	...	...	...	·192
Undetermined	...	...	...	...	...	4·678
						<hr/> 100·000

The 66·320 per cent. of sesquioxide of iron is equal to 46·424 per cent. of metallic iron.

No. 42. Magnetic Iron Ore. Clarence River.

Found associated in a mineral vein with copper pyrites.

Percentage of metallic iron, 15·59.

LIMESTONES.

No. 18.—Limestone. Wallerawang Reserve.

A subcrystalline limestone, containing fossils, such as corals, encrinites, and other similar forms, which had weathered and become exposed on the surface. In colour almost white, mottled with pale-grey, and further variegated by occasional brown streaks. Should polish well.

ANALYSIS.

Silica and insoluble matter	...	...	...	...	00·720
Sesquioxide of iron and alumina	...	...	...	...	1·100
Lime...	...	...	...	...	54·096
Magnesia	...	...	...	...	·567
Carbonic acid	...	...	...	...	42·704
Undetermined	...	...	...	...	·813
					100·090

This limestone consists almost entirely of calcium carbonate—the other substances present amounting to only about 3 per cent.

No. 19.—Limestone. Tarrabandra.

A subcrystalline limestone, but rather more crystalline than that from Wallerawang Reserve. In colour almost white, possessing but a pale buff shade marked with bluish grey bands. It is probable that this marble would take a rather better polish than the former.

ANALYSIS.

Silica and insoluble matter	...	...	...	...	00·160
Sesquioxide of iron and alumina	...	...	...	...	1·750
Lime	...	...	...	...	54·600
Carbonic acid	...	...	...	...	42·898
Magnesia	...	...	...	...	·605
					100·013

The substances in this limestone, other than calcium carbonate, equal but 2·5 per cent.

COPPER ORES.

No. 20.—Green Carbonate of Copper. Wiseman's Creek.

Mixed with the green carbonate are a few patches of the blue carbonate of copper; the ore occurs in a talcose and felspathic vein-stuff possessing a schistose character. Mixed with it is some brown oxide of iron.

Percentage of metallic copper, 16·72.

No 21.—Copper Pyrites. Wiseman's Creek, near Bathurst.

From outcrop of lode.

Percentage of metallic copper 9·10.

No. 22.—Copper Pyrites. Wiseman's Creek, near Bathurst.

Lode 18 ft. thick, depth 100 ft., associated with zinc blende, quartz, steatite and asbestos.

Percentage of metallic copper, 11·30.

No. 23.—Green Carbonate of Copper. South Wiseman's Creek.

Much the same as No. 20, only richer. A little fluor spar present, which from the presence of numerous fissures filled with blue carbonate of copper, would make a very pretty ornamental stone for inlaid work.

Percentage of metallic copper, 27·06.

No. 24.—Copper Pyrites. From South Wiseman's Creek.

Associated with the same minerals as No. 22.

Percentage of metallic copper, 12·78.

No. 25.—Copper Pyrites. Wellbank, Wellington.

The tarnished variety, known as "peacock" ore, associated with redruthite, (the grey sulphide), bornite or purple ore, and green and blue carbonates.

Percentage of metallic copper, 13·39.

No. 26.—Red Oxide of Copper. From 10 miles north of Wellington.

Mixed with the red oxide of copper is native copper, and associated with them are calcite and ferruginous earthy matter.

Percentage of metallic copper, 14·26.

No. 27.—Mixed Sulphides of Copper. Kadumble Range, Wellington.

Of the same character as No. 25.

Percentage of metallic copper, 8·98.

No. 28.—Green Carbonate of Copper. Three-mile Flat, Wellington.

Deep green colour, minutely mammilated, associated with a red earthy veinstuff.

Percentage of metallic copper, 13·15.

No. 29.—Copper Ore. Cargo, near Molong.

Of complex composition—containing cobalt and other metals. A more detailed analysis will be found under the head of auriferous minerals.

The mineral is black, has a dull lustre, gives a shiny streak and a brown powder. Breaks with a fracture, which varies from even to conchoidal. It occurs in veins built up of more or less parallel layers, and is associated with iron pyrites and a little white felspathic matter.

Percentage of metallic copper, 23·16.

No. 30.—Copper Pyrites. Ophir.

Associated with a little quartz.

Percentage of metallic copper, 27·40.

No. 31.—Copper Ore. Mitchell's Creek.

A gossany-looking ore, in steatitic matrix—containing visible gold (*vide* Gold-bearing minerals).

Gold equal to 1 oz. 2 dwts. 20 grns. per ton.

Percentage of metallic copper, 12·57.

No. 32.—Copper Ore. Mitchell's Creek, County of Lincoln.

A poor looking green carbonate, containing visible gold.

Gold equal to 4 ozs. 10 dwts. 8 grns. per ton.

Percentage of metallic copper, 9·48.

No. 33.—Red Oxide of Copper. Same locality.

Dull red colour, high specific gravity, stained with green carbonate on surface.

Contains *gold* equal to 14 ozs. 10 dwts. 6 grns. per ton.

Percentage of metallic copper, 25·79.

No. 34.—Copper Pyrites. Apsley, near Bathurst.

Interspersed with thin bands of quartz.

Percentage of metallic copper, 18·72.

No. 35.—Red Oxide of Copper. Same locality.

Associated with a talcose schist.

Percentage of metallic copper, 22·82.

No. 36.—Red Oxide of Copper. Peelwood, north of Tuena.

A rich massive ore, accompanied with chessylite, the blue carbonate of copper, in well formed crystals, and associated with asbestos.

Percentage of metallic copper, 49·27.

No. 37.—Copper Pyrites. Same locality.

A bright looking ore.

Percentage of metallic copper, 21·38.

No. 38.—Red Oxide of Copper. Bobby Whitlew, Bingera.

A massive, but dull brick red ore, coated in parts with green and blue carbonates.

Percentage of metallic copper, 19·94.

No. 39.—Copper Pyrites. Bingera, New England.

Mixed sulphides, but principally "peacock ore," associated with red oxide of iron.

Percentage of metallic copper, 23·71.

No. 40.—Copper Pyrites. Clarence River.

Associated with a little quartz.

Percentage of metallic copper, 24·19.

No. 41.—Red Oxide of Copper. Clarence River.

Massive.

Percentage of metallic copper, 22·67.

No. 42.—Copper Pyrites. Clarence River.

Associated with magnetic iron ore.

Percentage of metallic iron, 15·59.

Do. do. copper, 3·07.

NOTE.—Several of the above samples, in addition to Nos. 1, 32, and 33, contain small quantities of gold; particulars will be found in the separate report upon the gold bearing minerals.

PERCENTAGE COMPOSITION OF COPPER ORES.—TABULAR VIEW.

Oxidized Ores.

No.	Locality.	Description.	Percentage.
26.	Near Wellington.....	Red Oxide	14'26
38.	Bingera.....	"	19'94
41.	Clarence River.....	"	22'67
35.	Apsley, Bathurst.....	"	22'82
33.	Mitchell's Creek	"	25'79
36.	Peelwood, Tuena.....	"	49'27
32.	Mitchell's Creek	Green Carbonate	9'48
31.	" "	"	12'57
28.	Three Mile Flat, Wellington.....	"	13'15
20.	Wiseman's Creek	"	16'72
23.	South Wiseman's Creek.....	"	27'06

Pyritous Copper Ore.

42.	Clarence River.....	Pyrites	3'07
27.	Kadumble Range, Wellington	Mixed Sulphides	8'98
21.	Wiseman's Creek	Pyrites	9'30
22.	" "	"	11'30
24.	South Wiseman's Creek.....	"	12'78
25.	Wellbank, Wellington	Mixed Sulphides	13'39
34.	Apsley, Bathurst.....	Pyrites	18'72
37.	Peelwood, Tuena.....	"	21'38
29.	Cargo	Mixed Ore.....	23'16
39.	Bingera, New England	"	23'71
40.	Clarence River.....	Pyrites	24'19
30.	Ophir Copper Company.....	"	27'49

MINERAL.

No. 41.—Pink Mineral. Laumonite. (?)

This mineral was first observed by Mr. C. S. Wilkinson, the Government Geologist, and obtained by him from a cutting on the Bathurst Road, near the Cox River.

It occurs as small irregular veins, of a pleasing salmon colour, running through a soft bluish grey shale—the veins, together with the included plates of shale, are sometimes 6 inches thick, but usually smaller, the actual veins of the mineral itself being only about one eighth of an inch thick. Some difficulty was, on this account, experienced in obtaining sufficient of the sample pure enough for analysis.

Form, granular, also partially crystallized—nothing definite could be made out, but some of the confused crystals had somewhat the appearance of rhombic prisms. These prisms appear to cleave parallel to the long axis, also, but less perfectly, at right angles to it. Lustre, pearly; translucent.

Specific gravity, about 2·5.

Hardness, about 2·0 can be crushed by the thumb nail, being very tender. Streak pink, but paler than the mineral itself.

Heated in the closed tube it gives off water, and at a red heat becomes grey, but re-acquires a pink colour on cooling, which is rather paler than the original colour. On platinum foil, when strongly heated, it fuses to a whitish mass. Does not impart any distinctive tint to outer flame. With nitrate of cobalt gives a blue colour. Soluble in HCl. with separation of much gelatinous silica.

ANALYSIS.

Combined water	...	...	...	...	...	...	12·646
Silica	...	...	...	...	...	...	53·266
Alumina and traces of iron			...	...	...	...	22·833
Lime	...	...	...	...	...	...	11·000
Magnesia	...	...	...	...	...	...	·479
							100·224

REPORT

UPON CERTAIN OF THE

AURIFEROUS AND STANNIFEROUS TAILINGS,
AURIFEROUS AND ARGENTIFEROUS COPPER ORES,
AND OTHER MINERALS

OF

NEW SOUTH WALES.

BY

ARCHIBALD LIVERSIDGE,

PROFESSOR OF MINERALOGY IN THE UNIVERSITY OF SYDNEY, ASSOC. ROY. SCH. OF MINES, LONDON,
LATE SCHOLAR OF CHRIST'S COLLEGE, CAMBRIDGE.

PART II.

NOTE.

THE following pages contain the results of an investigation, made at the request of the Hon. J. Lucas, M.P., Minister for Mines, into the chemical composition of a number of samples of minerals, collected by the officers of the Mining Department from some of the principal gold fields and metalliferous deposits in various parts of New South Wales. These specimens were submitted to me for examination with special reference to their economic value, and it is therefore on that account that in most cases only the commercially valuable constituents have been estimated.

This second instalment contains the analysis of a number of auriferous tailings, waste products, auriferous and argentiferous copper ores, tin tailings, and certain other metalliferous ores.

ARCHIBALD LIVERSIDGE.

Sydney, February, 1876.

MINERALS OF NEW SOUTH WALES.

AURIFEROUS TAILINGS.

THE following Report contains the result of the chemical determination of the amounts of gold and silver contained in a number of samples of quartz-tailings and other waste gold-bearing products, which were expressly collected from the various gold fields of New South Wales for this investigation, so as to insure that none but fair and impartial samples, as distinguished from mere specimens, were submitted to examination, and that the information obtained with respect to the loss of the precious metals might by that means be made as certain and trustworthy as possible.

In many cases it will be seen that the quantities of gold and silver annually cast away, and in most cases irrevocably lost, are very great indeed. The value thus yearly lost to the Colony must be almost incalculably great.

The necessity for the use of more thorough and scientific methods, similar to those employed elsewhere, is in certain cases most glaringly apparent. Further comment on my part would be superfluous.

It will be seen that the tailings yet collected, and herein reported upon, are for the most part non-pyritous, hence their thorough and effective treatment should be comparatively simple, easy, and free from expense, and a well advised attempt to recover the gold now left in the waste products should prove a most profitable enterprise.

No. 43.—Mitchell's Creek, near Bathurst.

Quartz tailings, composed of rather coarse particles of quartz, mixed with loose powdery oxide of iron. This sample has the appearance of having been calcined; the iron oxide is therefore probably derived from the decomposition of pyrites.

Gold—0 oz. 7 dwts. 4 grns. per ton.

Silver—traces.

No. 44.—Consols' Engine, Grenfell.

Quartz tailings of a pale brown colour.

Gold—1 oz. 6 dwts. 18 grns. per ton.

Silver—1 oz. 4 dwts. 4 grns. per ton.

No. 45.—Mathison's Engine, Grenfell.

Quartz tailings fine, quartz grains mixed with a buff coloured powder

Gold—0 oz. 3 dwts. 22 grns. per ton.

Silver—traces.

No. 46.—Slee's Engine, Grenfell.

Quartz tailings, nearly white in colour.

Gold—0 oz. 3 dwts. 22 grns. per ton.

Silver—traces.

No. 47.—Victoria Mill, Grenfell.

Quartz tailings, nearly white in colour.

Gold—0 oz. 1 dwt. 7 grns. per ton.

Silver—traces.

No. 48.—Vaughan's Engine, Grenfell.

Quartz tailings, of a yellowish brown colour.

Gold—1 oz. 2 dwts. 22 grns. per ton.

Silver—0 oz. 0 dwts. 14 grns. per ton.

No. 49.—Kirkpatrick's Engine, Grenfell.

Quartz tailings, mixed with small agglutinated lumps of iron oxide.

Gold—0 oz. 9 dwts. 19 grns. per ton.

Silver—traces.

No. 50.—Nerrimunga, County of Argyle.

Quartz tailings, of a greenish colour, mixed with pyrites.

Gold—0 oz. 4 dwts. 13 grns. per ton.

Silver—traces.

No. 51.—Nerrimunga, County of Argyle.

Quartz tailings, of a grey colour.

Gold—0 oz. 7 dwts. 19 grns. per ton.

Silver—0 oz. 13 dwts. 2 grns. per ton.

No. 52.—Nundle, County of Parry.

Quartz tailings, white in colour.

Gold—0 oz. 6 dwts. 10 grns. per ton.

Silver—traces.

No. 53.—Nundle, County of Parry.

Sludge, of a greenish colour, containing friable lumps.

Gold—0 oz. 1 dwt. 7 grns. per ton.

Silver—traces.

No. 54.—Hill End.

Quartz tailings, calcined, mixed with iron oxide.

Gold—0 oz. 1 dwt. 7 grns. per ton.

Silver—traces.

No. 55.—Hill End.

Quartz tailings, of a brown colour.

Gold—0 oz. 1 dwt. 7 grns. per ton.

Silver—traces.

No. 56.—Hill End.

Quartz tailings, roasted, of a brown colour.

Gold—0 oz. 2 dwts. 14 grns. per ton.

Silver—traces.

No. 57.—Hill End.

Quartz tailings, of a brown colour.

Gold—0 oz. 3 dwts. 6 grns. per ton.

Silver—traces.

No. 58.—Hill End.

Sludge, containing light coloured subangular argillaceous pebbles, mixed with a little quartz.

Gold—0 oz. 0 dwts. 15 grns. per ton.

Silver—traces.

No. 59.—Hill End.

Quartz tailings, calcined, mixed with much red oxide of iron.

Gold—0 oz. 2 dwts. 14 grns. per ton.

Silver—traces.

No. 60.—Clear Creek.

Quartz tailings, white quartz mixed with other substances giving the tailings a pale brown colour.

Gold—0 oz. 9 dwts. 19 grns. per ton.

Silver—11 oz. 11 dwts. 5 grns. per ton.

No. 61.—Clear Creek.

Quartz tailings, pale brown colour, much the same as No. 60.

Gold—0 oz. 8 dwts. 11 grns. per ton.

Silver—12 ozs. 18 dwts. 18 grns. per ton.

No. 62.—Tumberumba.

Quartz tailings, white in colour; the quartz particles are very transparent and have a very vitreous lustre, therefore very glassy looking.

Gold—0 oz. 5 dwts. 21 grns. per ton.

Silver—traces.

No. 63.—Dragon Gold Mining Company. Hill End.

Quartz tailings, of a brown colour.

Gold—0 oz. 3 dwts. 22 grns. per ton.

Silver—traces.

No. 64.—Dragon Gold Mining Company. Hill End.

Blanketting—colour, dark brown.

Gold—0 oz. 7 dwts. 4 grns. per ton.

Silver—0 oz. 13 dwts. 2 grns. per ton.

No. 65.—Dragon Gold Mining Company. Hill End.

Waste, a mass of soft white pipeclay.

Gold—0 oz. 1 dwt. 7 grns. per ton.

Silver—traces.

No. 66.—Excelsior Machine. Tambaroora.

Quartz tailings, roasted, of a pinkish colour.

Gold—0 oz. 3 dwts. 6 grns. per ton.

Silver—traces.

No. 67.—Red Hill Machine. Tambaroora.

Quartz tailings, white in colour.

Gold—0 oz. 7 dwts. 4 grns. per ton.

Silver—traces.

No. 68.—Independent Machine. Tambaroora.

Quartz tailings, light brown colour, mixed with a few uncrushed lumps.

Gold—0 oz. 0 dwt. 15 grns. per ton.

Silver—traces.

No. 69.—Sydney and Tambaroora Machine. Tambaroora.

Quartz tailings, of a pale brown colour.

Gold—0 oz. 5 dwts. 5 grns. per ton.

Silver—traces.

No. 70.—South Lead. Forbes.

Sludge, yellowish brown colour, agglutinated into lumps.

Gold—0 oz. 1 dwt. 7 grns. per ton.

Silver—traces.

No. 71.—Victoria Lead. Forbes.

Sludge, clay coloured, lumpy ; much the same as the last.

Gold—0 oz. 4 dwts. 13 grns. per ton.

Silver—traces.

No. 72.—Mathinson's Lead. Forbes.

Sludge, red coloured loose clay like material.

Gold—0 oz. 6 dwts. 10 grns.

Silver—traces.

No. 73.—Britannia Reef. Forbes.

Quartz tailings, yellow brown colour.

Gold—0 oz. 1 dwt. 23 grns.

Silver—traces.

No. 74.—Strickland's Reef. Forbes.

Quartz tailings, finely divided, brown in colour.

Gold—0 oz. 16 dwts. 23 grns. per ton.

Silver—0 oz. 6 dwts. 11 grns. per ton.

No. 75.—Williams' Battery. Adelong.

Quartz tailings, nearly white in colour.

Gold—0 oz. 3 dwts. 22 grns. per ton.

Silver—traces.

No. 76.—Williams' Battery. Adelong.

Quartz tailings, same as above.

Gold—0 oz. 1 dwt. 7 grns. per ton.

Silver—traces.

No. 77.—Braidwood.

Sludge, principally clay mixed with roots of plants, and containing fragments of quartz leaders.

Gold—0 oz. 3 dwts. 22 grns. per ton.

Silver—traces.

No. 78.—Braidwood.

Quartz tailings, calcined.

Gold—0 oz. 8 dwts. 11 grns. per ton.

Silver—traces.

No. 79.—Burne's Machine. Wiseman's Creek, Oberon.

Quartz tailings, of a brown colour.

Gold—0 oz. 9 dwts. 3 grns. per ton.

Silver—0 oz. 12 dwts. 9 grns. per ton.

No. 80.—Lambert and Davies'. Wisemans Creek, Oberon.

Quartz tailings.

Gold—0 oz. 2 dwts. 14 grns. per ton.

Silver—traces.

No. 81.—Whelan's Machine. Glendwi, Oberon.

Quartz tailings, in fine state of division, of a light brown colour.

Gold—0 oz. 0 dwt. 15 grns.

Silver—traces.

No. 82.—Long Flat. Major's Creek.

Gold—0 oz. 1 dwt. 7 grns. per ton.

Silver—traces.

No. 83.—Big Hill. Major's Creek.

Quartz tailings, brown in colour.

Gold—0 oz. 1 dwt. 7 grns. per ton.

Silver—traces.

No. 84. Spring Creek. Majors Creek.

Apparently a calcined pyrites, a dark chocolate brown powder.

Gold—0 oz. 17 dwts. 15 grns. per ton.

Silver—1 oz. 12 dwts. 0 grn. per ton.

No. 85.—Hargraves.

Quartz tailings, coarse-grained; calcined.

Gold—0 oz. 1 dwt. 7 grns.

Silver—traces.

No. 86.—Belmore.

Quartz tailings, almost white in colour.

Gold—0 oz. 6 dwts. 10 grns. per ton.

Silver—0 oz. 19 dwts. 17 grns. per ton.

No. 87.—Cowra.

Sludge. An argillaceous sharp gravel; *i.e.*, the fragments are not water-worn.

Gold—0 oz. 0 dwts. 15 grns. per ton.

No. 88.—Tuena.

Quartz tailings, calcined; of an ordinary brown colour.

Gold—1 oz. 0 dwt. 21 grns. per ton.

Silver—0 oz. 16 dwts. 3 grns. per ton.

No. 89.—Tuena.

Tailings, of a greenish grey colour; contains pyrites and a few rounded pebbles.

Gold—0 oz. 3 dwts. 6 grns. per ton.

Silver—traces.

No. 90.—Tuena.

Quartz tailings, milky white colour.

Gold—0 oz. 13 dwts. 17 grns. per ton.

Silver—traces.

No. 91.—Tower Hill Company's Battery. Dalmorton, Little River.

Quartz tailings, white quartz mixed with a grey powder, probably derived from slate casing or matrix.

Gold—0 oz. 1 dwt. 23 grns.

Silver—traces.

No. 92.—Lombardy Company's Battery. Solferino.

Quartz tailings, of a brown colour.

Gold—0 oz. 7 dwts. 20 grns. per ton.

Silver—traces.

No. 93.—Band of Hope Company. Solferino.

Quartz tailings, of a very pale brown colour.

Gold—0 oz. 0 dwt. 15 grns. per ton.

No. 94.—Enterprise Battery. Cunglebung, near Dalmorton, Little River.

Quartz tailings.

Gold—0 oz. 7 dwt. 4 grns. per ton.

Silver—traces.

No. 95.—Faugh-a-Ballagh Reef. Oberon.

Quartz tailings, mixed with pyrites.

Gold—1 oz. 15 dwts. 22 grns. per ton.

Silver—0 oz. 7 dwts. 4 grns. per ton.

No. 96.—King of the West. Trunkey.

Quartz tailings, of a grey colour, from a depth of 50 to 120 feet.

Gold—0 oz. 4 dwts. 13 grns. per ton.

Silver—traces.

No. 97.—King of the West. Trunkey.

A yellow-brown powder; from the discharge shoot, after passing through the amalgamating barrels. Depth 500 ft.

Gold—0 oz. 12 dwts. 9 grns. per ton.

Silver—traces.

No. 98.—Lady Bowen Machine. Trunkey.

Quartz tailings, very pale brown colour, from depth of 500 ft.

Gold—0 oz. 1 dwt. 23 grns. per ton.

Silver—traces.

No. 99.—Trunkey Creek Quartz Mining Company. Trunkey.

Quartz tailings, of a light brown colour. Depth 300 ft.

Gold—0 oz. 1 dwt. 7 grns. per ton.

Silver—traces.

AURIFEROUS MINERALS.**No. 100.—Quartz vein. Mitchell's Creek.**

Containing a small amount of iron pyrites and a minute quantity of copper sulphides, both bornite and chalcoppyrites being present.

Gold—traces.

Silver—6 ozs. 15 dwts. 5 grns. per ton.

No. 101.—Calcite vein. Armstrong Copper Mine, Wiseman's Creek.

Massive; large cleavage planes, slightly coloured in parts with green copper carbonate, and in places coated with brown oxide of iron.

Gold—0 oz. 0 dwt. 6 grns. per ton.

Silver—0 oz. 5 dwts. 5 grns. per ton.

No. 102.—Iron Pyrites. Cow Flat, Bathurst.

From outcrop of lode. Massive, with cubical crystals attached.

Sulphur	...	...	...	...	...	27·560
Cobalt	...	...	...	...	...	·016
Nickel	...	...	...	...	...	none.
Iron, silica, &c.	...	...	...	...	...	72·424

100·000

Gold—0 oz. 4 dwts. 13 grns. per ton.

Silver—traces.

No. 103.—Iron Pyrites.

Sulphur...	...	...	...	...	34·44 per cent.
Cobalt ...	...	...	...	...	traces.
Nickel ...	...	...	...	...	·16 „
Iron, silica, &c.	...	...	...	...	65·40 „
					<hr/>
					100·00

Gold—0 oz. 2 dwts. 14 grns.

Silver—traces.

No. 104.—Iron and Copper Pyrites. Trunkey.

From newly discovered quartz reef near Trunkey. Reef 18 inches in width.

Metallic copper—10·65 per cent.

Gold—0 oz. 3 dwts. 6 grns. per ton.

Silver—0 oz. 11 dwts. 2 grns. per ton.

No. 105.—Mispickel. Prince William Mine, Ironbarks, near Orange.

A compound of iron, arsenic, and sulphur; both the sulphur and the arsenic should be saved during the treatment of this mineral, which contains about 46·0 per cent. of arsenic and 19·0 per cent. sulphur. Contains visible gold.

By assay:—Gold ... 213 ozs. 19 dwts. 8 grns. per ton.

Free „ ... 4 „ 11 „ 11 „ „

Total „ ... 218 ozs. 10 dwts. 19 grns. per ton.

Silver... 0 „ 9 „ 3 „ „

No. 106.—Magnetic Iron Ore. Mount Lambie Iron Mine.

Massive, finely granular structure. Associated with a chloritic schist.

Gold—0 oz. 1 dwt. 7 grns. per ton.

Silver—none.

Metallic iron—35·62 per cent.

No. 107.—Magnetic Iron Ore. Carn Creek, Bungonia.

Massive, finely granular structure.

Gold—0 oz. 3 dwts. 6 grns. per ton.

Silver—0 oz, 5 dwts. 5 grns. per ton.

No. 108.—Granite. Hartley.

A very compact close-grained granite, composed of dull flesh-coloured orthoclase felspar, quartz, and a little brown-black mica. Contains a small quantity of iron pyrites.

Many different samples of this granite were examined for gold, and in several cases, traces both of that metal and of silver were met with; but it was found to be present only in those specimens which contained iron pyrites—the rock itself was proved to be free from gold.

No. 109.—Granite. Hartley. Obtained from shaft.

A nearly white, coarse-grained, or porphyritic granite. The felspar is orthoclase, and in part, where crystallized, of a pale dull pink tint; other portions of the felspar are finely granular or powdery, and of a pure white colour. In the rock are small cavities, usually containing quartz crystals and galena; the galena is also disseminated in small quantities through the felspathic portions, but most of it is closely associated with the quartz. In this case, also, the rock itself was found not to contain gold, but where galena was present, traces of gold were met with, and silver was present to the extent of 3 ozs. 8 dwts. 14 grns. per ton.

AURIFEROUS AND ARGENTIFEROUS COPPER ORES.

On examining some of the copper ores for the precious metals, it was found that several of them contained really considerable quantities of both gold and silver. The amount of gold present in three of the richest of them have already been stated in the first part of this report (*vide* Nos. 31, 32, and 33), but for the sake of completeness they are cited again with the others.

There is no reason why most of these ores should not be successfully treated for the extraction of the precious metals which they contain.

It was considered unnecessary to state the amount of silver when less than 1 oz. per ton.

The numbers to these specimens are the same as in the first report.

No. 20.—Green Carbonate of Copper. Wiseman's Creek.

Metallic Copper—16·72 per cent.

„ Silver—7 oz. 13 dwts. 17 grns. per ton.

Gold—traces.

No. 23.—Green Carbonate of Copper. South Wiseman's Creek.

Metallic Copper—27·06 per cent.

„ Silver—21 ozs. 19 dwts. 16 grns. per ton.

„ Gold—traces.

No. 24.—Copper Pyrites. Wiseman's Creek.

Metallic Copper—12·78 per cent.

„ Silver—6 oz. 17 dwts. 4 grns. per ton.

„ Gold—traces.

No. 27.—Mixed Sulphides of Copper. Kadumbe Range, Wellington.

Metallic Copper—8·98 per cent.

„ Silver—3 ozs. 18 dwts. 9 grns. per ton.

„ Gold—traces.

No. 28.—Green Carbonate of Copper. Three-mile Flat, Wellington.

Metallic Copper—13·15 per cent.

„ Silver—8 ozs. 3 dwts. 8 grns. per ton.

„ Gold—traces.

No. 29.—Mixed Ore. Cargo.

Metallic Copper—23·16 per cent.

„ Silver—25 ozs. 12 dwts. 20 grns. per cent.

„ Gold—traces.

„ Cobalt—0·43 per cent.

„ Nickel—7·40 „

(For further particulars *Vide* p. 15 of Part I.)

Nickel is worth about 10s. 6d. per lb.; hence, roughly speaking, the amount of nickel in a ton of this ore would be worth at least £70. Cobalt is worth about 32s. per lb.

No. 30.—Copper Pyrites. Ophir.

Metallic Copper—27·49 per cent.

„ Silver—6 ozs. 0 dwts. 20 grns. per ton.

„ Gold—traces.

No. 31.—Green Carbonate of Copper. Mitchell's Creek.

Metallic Copper—12·57 per cent.

„ Silver—13 ozs. 13 dwts. 6 grns. per ton.

„ Gold—1 oz. 2 dwts. 20 grns. „

No. 32.—Green Carbonate of Copper. Mitchell's Creek, County of Lincoln.

Metallic Copper—9·48 per cent.

„ Silver—9 ozs. 9 dwts. 19 grns. per ton.

„ Gold—4 ozs. 10 dwts. 18 grns. „

No. 33.—Red Oxide of Copper. Mitchell's Creek.

Metallic Copper—25·79 per cent.

„ Silver—1 oz. 11 dwts. 7 grns. per ton.

„ Gold—14 ozs. 10 dwts. 6 grns. „

No. 34.—Copper Pyrites. Apsley, near Bathurst.

Metallic Copper—18·72 per cent.

„ Silver—10 ozs. 6 dwts. 10 grns.

„ Gold—traces.

No. 36.—Red Oxide of Copper. Peelwood, Tuena.

Metallic Copper—49·27 per cent.

„ Silver—4 ozs. 4 dwts. 22 grns.

„ Gold—traces.

No. 37.—Copper Pyrites. Peelwood, Tuena.

Metallic Copper—21·38 per cent.

„ Silver—12 ozs. 11 dwts. 14 grns.

„ Gold—traces.

No. 38.—Red Oxide of Copper. Bobby Whitlow, Bingera.**Metallic Copper—19·94 per cent.**

,, Silver—1 oz. 2 dwts. 5 grains per ton.

,, Gold—traces.

No. 42.—Copper Pyrites and Magnetite. Clarence River.**Metallic Copper—3·07 per cent.**

,, Iron—15·59 „

,, Silver—2 ozs. 15 dwts. 12 grns. per ton.

,, Gold—traces.

No. 110.—Copper and Iron Pyrites. Armstrong Mine, Wiseman's Creek.

(From a new lode.)

Metallic Copper—6·16 per cent.

,, Gold—0 oz. 5 dwts. 17 grns. per ton.

,, Silver—2 ozs. 15 dwts. 12 grns. per ton.

TIN TAILINGS.

It is satisfactory to find that, with but one or two exceptions, the value of the tin which is lost in the form of tailings and other waste products is but small in comparison to the loss which is sustained in the treatment of gold-bearing minerals.

But by the introduction of a higher class of machinery than that usually employed for the treatment of tin ores in this Colony the results obtained would be greatly superior to the present general order of things, and an industry now somewhat unpopular and unremunerative would speedily undergo a complete revolution and change for the better.

Waste products which contain more than a few hundredths per cent. of metallic tin should on no account be cast away, but be carefully reserved for subsequent treatment.

Tin ores which originally only contain 0·5, or one-half per cent., of metal are found to pay well in Cornwall.

No. 111.—Ashton's Mine. Little Britain, Vegetable Creek.

A subangular gravel, probable the newer alluvial.

Metallic Tin—0·103 per cent.

„ Gold—0 oz. 0 dwts. 15 grns. per ton.

No. 112.—Spear and Moore's Mine. Vegetable Creek.

A sandy gravel, containing quartzoze and felspathic pebbles.

Metallic Tin—0·102 per cent.

„ Gold—traces.

No. 113.—Baalgammon Company. Vegetable Creek.

A sandy gravel, containing silicious and felspathic rounded and sub-angular pebbles.

Metallic Tin—0·069 per cent.

„ Gold—traces.

No. 114.—Hall Bros., and Company. Vegetable Creek.

Sand, with quartz porphyry fragments.

Metallic Tin—0·076 per cent.

„ Gold—traces.

No. 115.—Rothschild and Co. Vegetable Creek.

A brown coloured sandy gravel.

Metallic Tin—1·015 per cent.

„ Gold—traces.

No. 116.—Great Britain Company. Vegetable Creek, New England.

A coarse pebbly washdirt.

Metallic Tin—·059 per cent.

„ Gold—traces.

No. 117.—Great Britain Company. Vegetable Creek, New England.

A sandy gravel.

Metallic Tin—·009 per cent.

„ Gold—traces.

No. 118.—O'Daly's Mine. Vegetable Creek.

A grey quartzoze sand, with ill-formed smoky grey quartz crystals and felspathic pebbles, which are evidently derived from the decomposition of a felspathic porphyry.

Metallic Tin—0·106 per cent.

„ Gold—traces.

No. 119.—Campbell's Mine. Cubiss' Tribute, Vegetable Creek.

A red sandy gravel, containing much pisolitic brown oxide of iron.

Metallic Tin—0·312 per cent.

„ Gold—traces.

ANTIMONY.

No. 120.—Antimonite. Pyramul.

In splendid massive blocks, showing well-developed striated cleavage planes. Exterior coated with the yellow coloured oxide of antimony (SbO_2) known as cervantite.

Metallic Antimony	67·74 per cent.
Gold	traces.
Silver	traces.

MINES AND MINERAL STATISTICS.

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ANNUAL REPORT

OF THE

DEPARTMENT OF MINES,

NEW SOUTH WALES,

FOR THE YEAR

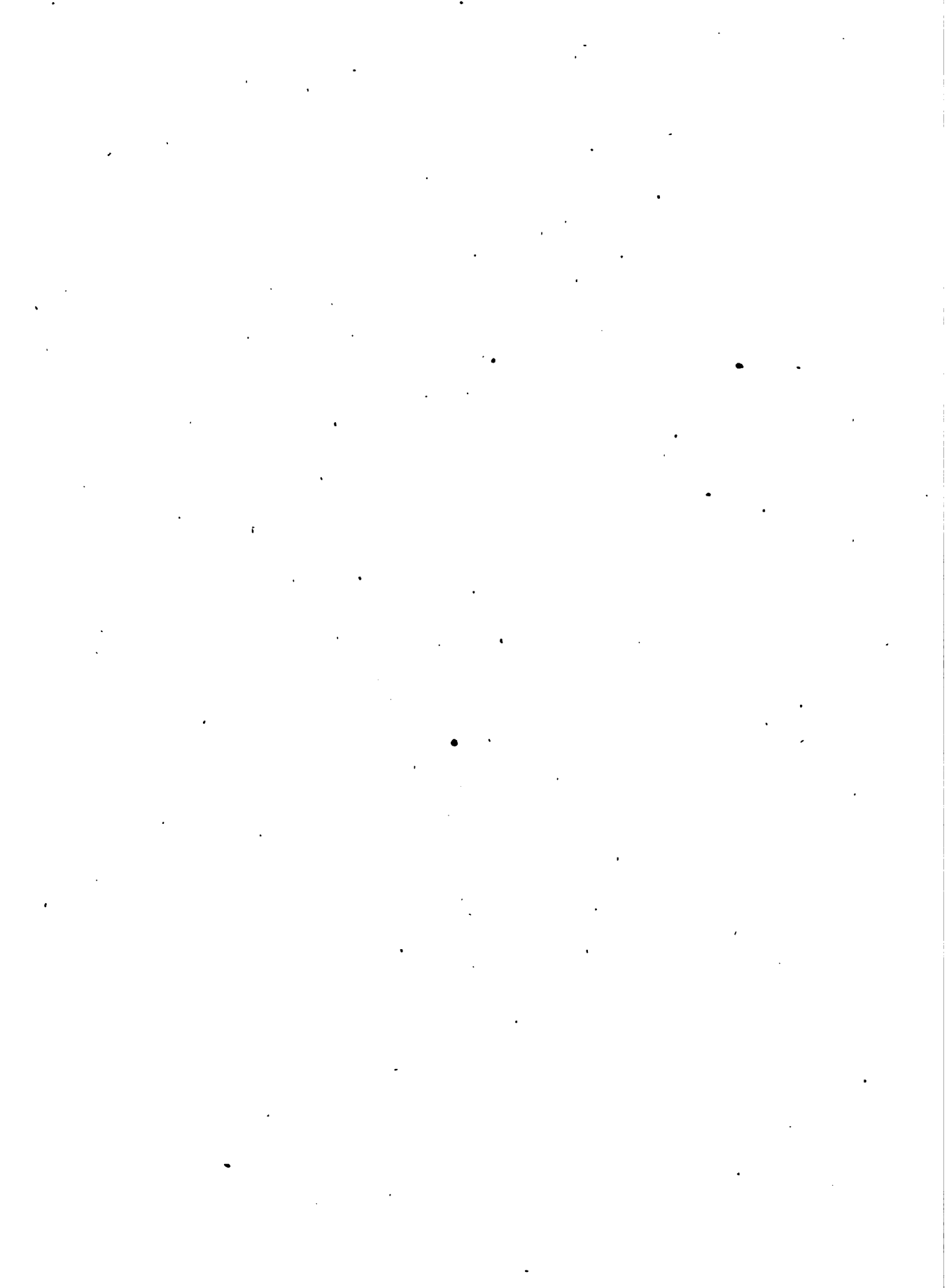
1876.

SYDNEY: CHARLES POTTER, ACTING GOVERNMENT PRINTER.

[5s.]

1877.

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MEMORANDUM.

THE reception of the within Report affords me an opportunity of endorsing the statements therein as to the satisfactory working of the Department of Mines, and expressing my high appreciation of the very valuable services rendered by the Under Secretary, the Geological Surveyor, and the other officers.

Their unremitting zeal in the discharge of the important duties entrusted to them has largely contributed to the success which has attended my administration of the Department.

The energy and ability with which these gentlemen have seconded my efforts to advance the Mining interests, by making known the extent and value of our mineral resources deserve my highest commendation; while to those gentlemen outside the Department who have contributed to the valuable collection of

CORRIGENDA.

Page 45. For "marsupial" read "bird"

Page 82. Under the head of "Geological Features" the quotation from the letter of the Rev. W. B. Clarke, M.A., F.G.S., &c., &c., should read thus:—

were sent to me—one a very small and imperfect brachiopod, apparently a rhynchonella; the other fragments of a crinoid; the latter from the Ben Nevis Lead. They were all in such a condition as to prevent determination.

I also had subsequently a few small pieces of bone from a shaft at a distance from the Ben Nevis. These were supposed to be "human," but they were nothing of the kind, and probably belonged to one of the marsupial creatures of the Quarternary epoch, if even in drift of 30 feet thick.

As Professor Dawkins, F.R.S., author of the valuable work on Caverns (Cave Hunting) was leaving me for England I sent them on to him before he went. He replied on his way from San Francisco confirming my opinion.

I received one other specimen, but a piece of limestone, said to have come from below the shell."

Wales; in fact a ship-load of emigrants—not the idle or unemployed of the old countries, but well-to-do skilled mechanics and farmers who have paid half the costs of their transport, and who bring with them means to establish themselves here—are now on their way to cast in their lot with ours. They are the class of colonists for whom the Colony is languishing; men who will bring with them all the ingenious devices that ease labour, improve agriculture, and establish manufactories.

Mr. Morris, after having visited and inspected our Museum of Mines, gave it as his opinion that many institutions in America would give £20,000 for such a collection.

JOHN LUCAS.

Department of Mines,
March 8th, 1877.

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ANNUAL REPORT.

TO THE HONORABLE JOHN LUCAS, Esq., M.P., MINISTER FOR MINES, &c., &c., &c.

SIR,

I have the honor to submit the following Report upon the Mining Districts and Mineral Products of the Colony for the year 1876. In doing so, I gratefully acknowledge the information kindly given to me by the Deputy Master of the Mint, the Collector of Customs, and the Commissioner of Railways. I have also to acknowledge the ready help and valuable information supplied by the officers of this Department, both in the office and in the field.

Before offering any remarks upon our mineral products, I desire to refer briefly to the satisfactory manner in which the work of the Department has been carried on. Notwithstanding that many of the officers were new to the work, they have performed their duties ably and zealously, the best evidence of which is the progress made.

Since the Department was formed, in August, 1874, some thirteen thousand of the applications to lease mineral land, made prior to the creation of this Department, have been disposed of, and six thousand applications to lease auriferous land also made before the Department was established have been dealt with. When it is considered that the bulk of these applications had been made as far back as 1872-3, and that interests therein had been sold, transferred, or otherwise encumbered, and that consequently some cases presented complications more or less serious, it will be understood that the amount of work performed has been considerable. In some two or three cases I regret to say dissatisfaction has been expressed by persons who have felt aggrieved either at the decision arrived at or at the expedition used by this Department in disposing of applications, which, though long pending, had not been held in abeyance long enough to suit their purposes.

As might have been expected under the circumstances, the greater number of these leases have been cancelled; the land in many cases taken up without any judgment during a period of excitement, containing no minerals of any value, has not since been taken up, but a considerable quantity of valuable mineral land, which had been locked up under those applications, has been re-applied for, and is now being, or will be, profitably worked. Already the throwing open of such lands has, in more than one instance, led to valuable discoveries of mineral deposits.

In addition to clearing off such a mass of old work, the Department has disposed of 681 new applications—of which 236 were to lease mineral lands and 445 were to lease auriferous lands. But for the difficulty of getting surveys made, applications to lease would now be disposed of with reasonable expedition.

During the past year 410 applications were received to lease in the aggregate 13,676 acres of mineral land, and 202 applications were received to lease in the aggregate 920 acres of auriferous land.

Valuable work has also been done in the collection and exhibition of Minerals and Fossils, and the highest praise is due to Mr. Wilkinson, F.G.S., and other officers of the Department, both in Sydney and in the districts, for the valuable services they have rendered, the latter in collecting, the former both in collecting and arranging. The Department is deeply indebted to Managers of Mines and other gentlemen who have kindly forwarded valuable specimens to the collection. The exhibits sent by the Department to the Queensland Exhibition, to the Metropolitan Exhibitions in Sydney, and to other Exhibitions in the Country Districts, have received high commendation, and have doubtless done much good in spreading information as to our mineral resources, and in making visitors acquainted with the appearance of ores, &c., &c., so that in the event of their meeting with specimens of such ores in their travels they may know that they possess an economic value and may profit thereby or enable others to do so.

The exhibits sent to the Centennial Exhibition at Philadelphia, though the result of only a few months' labour in collecting and arranging, have made known to the world that the mineral resources of this Colony are exceptionally great, and have attracted to the Colony visitors from the continent of Europe, some of whom say they had scarcely even heard of such a place as New South Wales until they visited the Philadelphia Exhibition. Amongst others were Mr. Frank Grein, of Geneva, Switzerland, the Government Special Delegate to the Philadelphia Exhibition, and M. Chs. Deisenhammer, a civil engineer of some considerable repute in Europe, who has had charge of important engineering works in Russia and elsewhere, both of whom expressed surprise at the evidences of our wealth in minerals. The following note written to you by M. Deisenhammer at the close of his visit to this Colony, conveys an idea of the impression made upon him.*

*NOTE.—At the Centennial Exhibition of Philadelphia—which gave to the numerous visitors proofs of the progress of industry, art, and science—the exhibits of the Australian Colonies in particular constantly attracted large numbers, and more so because of the fact that by the majority of the inhabitants of the old world Australasia is considered to be a *terra incognita* at present still in a very primitive state of development. The exhibits, however, opened the eyes of these people. It was a source of astonishment that a country which has been discovered hardly a hundred years ago, and which was originally intended for a penal settlement, should in so short a time and labouring under a state of things not by any means favourable to culture, have developed itself so rapidly and successfully as to allow it to enter into competition with the old civilized countries. Indeed, Australian wheat is superior to any other, and Australian wines surpass with regard to the high percentage of alcohol contained in them the best wines of the globe, a fact which has been ultimately accepted by the French after a long resistance; Australian wool is the most valuable and most sought after of all. The flora too of Australia offers much interest and utility. The consideration that all these products can only by degrees be brought to that high standard of excellence and perfection, reminds one that human genius and talent are independent of climes, and have taken up their abode even in the distant regions of Australasia and there kindled the torch of progress. Among the Australian exhibits the splendid and extensive collection of minerals, &c., constituted one of the most interesting parts. These were constantly the object of observation of scientific men. It was generally admitted that with regard to mining a pre-eminent position must be assigned to Australia, that by these collections a most valuable material for scientific research had been supplied and considerable light thrown on geological hypothesis. The superior disposition was no less a proof that Australia can boast of men who are an ornament to science. There was only one point which was universally regretted, viz., the great distance which separates Australia from the rest of the world, and which renders it possible for a limited number of favoured ones only to make a professional use of the abundant scientific treasures. The entire exhibition gave the impression that the Australian Colonies have a great future before them, and that they are striding towards it with a rapid pace.—C. DEISENHAMMER, Sydney, the 27th January, 1877.

Mr. Augustus Morris, the Executive Commissioner at Philadelphia, says in his letter to you, dated 10th July last—

In all the Exhibition, nothing has attracted the attention and interest of the men of science from all countries so much as the exhibits from the Department of Mines, New South Wales. Most anxious wishes have been expressed by every scientific institution in this country to possess some of these mineral specimens, particularly those showing the tin lodes and stream and wood tin. If these specimens are not distributed in this country, it will occasion great surprise and astonishment. Most gladly will the Smithsonian Institution receive for you specimens in exchange from those who may obtain your specimens. Above all, the Smithsonian Institution ought to be considered, for its liberality is unbounded, and through it the Department of Mines might obtain in exchange a unique collection of the minerals of America. * * * * * I trust you will kindly permit us to distribute the tin specimens and such other of the minerals as can readily be supplied in the Colony. May I also give the photographs of the fossil fish in the coal measures to the Smithsonian Institution?

In regard to your letter by the mail previous to this, desiring me to obtain models of mining machinery, I would remind you that the cost would be greater than you imagine. I think it would be better to spend a small sum of money in obtaining plans, specimens, and specifications of all the mining machinery invented and patented in this country. By the courtesy of Mr. Knight, who presides over the patent exhibits of the United States Government, I am having collected every document in the Patent Office at Washington relative to mining machinery of every kind. Those published up to the end of last year, and they are about five hundred, I can get for 5d. each, and those published since for 1s. each. For £20 or £25 I shall be able to send your Department valuable information in the most convenient form. If I see any machinery, models of which would be necessary, I will secure them or do whatever you desire in the matter.

The references in the American Press to our mineral exhibits were most flattering.

It is gratifying to find that the work "Mines and Mineral Statistics," which I had the honor of compiling by your direction for the Philadelphia Exhibition, has been favourably received both in America and England. Mr. Augustus Morris, in his letter above quoted, says:—"The book you have published on the mineral resources of New South Wales is greatly sought for and accepted with many thanks. I wish we had a few more copies." The Honorable William Forster, the Agent General of the Colony, under date 16th November, states that he has distributed all the copies sent to him, and asks for a further supply, "as the information contained in the pamphlet is of great interest and value."

During the greater part of the year the Geological Surveyor has been engaged in an examination of our more important auriferous deposits, with a view to point out what lands within the Gold Fields may be thrown open to settlement without injury to the mining interest. In the performance of this important work—the object of which is to promote settlement upon the lands suitable to agriculture in the immediate vicinity of mining centres—Mr. Wilkinson has done good service to the miners and the public generally, while the large amount of valuable information which he has collected in his travels, and has embodied in an able report herewith, amply testifies to the zeal with which he has discharged his duties.

I regret that I am not able to present a more flourishing statement of the result of last year's mining operations, but notwithstanding the decrease in the yield of some of our minerals, I have complete confidence in the future prosperity of our mines.

GOLD.

The quantity of gold sent to the Mint during the past year is shown in the following table, compiled from information supplied by the Deputy Master of the Mint.

RETURN of Gold imported into the Royal Mint, Sydney, during the year 1876, distinguishing the different localities from which such Gold was brought.

	ozs.		ozs.
Bathurst District...	Bathurst 5,450-36	Southern District..	Goulburn 601-07
	Carcoar 3,753-43		Braidwood..... 9,003-51
	Orange..... 6,672-80		Araluen 2,331-06
	Hill End 17,299-03		Adelong..... 16,432-54
Tambaroora & Turon District	Tambaroora 169-79	Tumut & Adelong District	Tumut 1,414-49
	Sofala 7,109-83		Tumbarumba 28-05
	Stony Creek 6,170-63		Gundagai 134-13
	Mudgee 5,436-26		Cooma 743-16
Mudgee District...	Gulgong 16,236-78		Kiandra 242-98
	Hargraves 1,991-15		Armidale 1,165-55
	Wellington 297-69	Peel and Uralla District	Rocky River 1,635-42
	Parkes 17,384-67		Nundle 940-21
	Tichborne 5,672-00		Tamworth 1,582-28
Lachlan District...	Forbes 904-39		Scone 18-05
	Grenfell 747-82	New South Wales, localities unknown	21,209-81
	Young 752-54		
		Total	153,531-48

DISTRICTS.

	ozs.		ozs.
Bathurst	15,876-59	Tumut and Adelong	18,995-35
Tambaroora and Turon	30,749-28	Peel and Uralla	5,341-51
Mudgee	23,961-88	Unknown.....	21,209-81
Lachlan	25,461-42		
Southern	11,935-64	Total	153,531-48

This shows a decrease as compared with the Mint Returns for 1875 of 73,454 ozs.

The quantity of gold passed through the Customs during 1876 is as follows :—

Dust.		Bars.		Total.	
Ounces.	Value.	Ounces.	Value.	Ounces.	Value.
1,080	£ 3,966	1,930	£ 7,765	3,010	£ 11,731

Being less by 887 ozs. than the quantity exported in 1875, consequently there is a decrease in our gold yield, as indicated by these returns, of 74,341 ozs. upon that of the previous year; but by comparing the quantity of gold won in 1876, according to the returns furnished by the Mining Registrars, with the quantity of gold passed into the Mint and through the Custom House in 1875, the decrease is only 63,471 ozs.

Though these figures cannot be said to represent the whole of the gold won in the Colony during the year, they certainly, so far as they go, indicate a serious falling off in the yield of our gold mines, from whatever cause or causes it may have arisen.

No doubt it may to a very great extent be traced to the effects of the long drought which in some localities seriously retarded, and in others put a stop to gold-mining. There are on several of the Gold Fields large quantities of alluvium which had been brought to the surface, but could not be washed on account of the want of water; had the whole of this earth

been treated, the decrease would have been considerably reduced. It is to be feared the drought has also had a very depressing effect upon the operations of that most valuable class of miners who were chiefly engaged in searching for new Gold Fields, because in many instances they have been unable to obtain sufficient water to test their "prospects," and in other instances the scarcity of water has deterred prospectors altogether from engaging in that branch of mining.

The consequences are, that some of our older fields have been almost or quite abandoned, and with the exception of the comparatively limited deposits at Back Creek, a tributary of the Barrington River, and some alluvial ground at Urana, the extent and value of which have not yet been ascertained, no new gold fields have been discovered.

As opposed to the assertion "that because gold has not yet been discovered in any given place it does not exist there," it may be safely affirmed that there are in this Colony numerous and extensive deposits of gold which will afford profitable employment to both prospector and miner for many years to come. The Rev. W. B. Clarke, M.A., F.R.S., &c., &c., in his paper on the progress of gold discovery in Australasia, from 1860 to 1871, says—"Gold is known to exist in less or greater abundance in this Colony (New South Wales) in an area of which the limits are both of longitude and latitude nearly nine degrees asunder—a sufficiently extensive region to offer expectation of many further developments of the precious metal. There is undoubtedly a justifiable ground for expectation of future discoveries between the limits assigned and the localities long established."

As one of numerous instances of the extent to which tracts of apparently auriferous country are untested, Mr. Philip Davies, one of the most experienced Mining Managers in this Colony, who has recently visited the Kiandra Gold Field, says—"The long Kiandra Plain, which resembles in appearance the Charlotte Plains in Victoria, is intersected by numerous large well defined quartz veins similar in appearance to those at Clunes, and strange to say there is nowhere to be seen any trace whatever of the hand of the prospector on these veins."

In addition to our large extent of unexplored auriferous country, our deep leads may be said to be almost untested, and even the oldest and most extensively worked of our diggings which will no longer pay the individual miner or the fossicker, will yet, if systematically worked on such a scale as will admit of the employment of suitable appliances, yield large quantities of gold.

Except in a very few localities our quartz veins have not been tested below two or three hundred feet, and in some places to a depth of only a few feet. This is partly due to the fact that in many of our veins the gold, instead of being evenly distributed through the stone, runs in shoots, which dip at greater or less angles, and are subject to frequent faults and irregularities, requiring great tact, close observation, and persistent industry to follow or recover.

The Inspector of Mines, in his very interesting report upon the Adelong mines, points to many instances; and numerous others could be cited in which miners, having passed through a vein of rich stone into barren or comparatively poor quartz, have abandoned the ground as worked out, when in point of fact, if they had persevered they would have cut the same shoot of gold again, or would have reached another seam of rich stone.

A false opinion that prevailed amongst some of our quartz-miners, that our reefs would not carry gold below certain limited depths has doubtless had the effect of deterring many from sinking deeper, and it is to be hoped that the explorations in depth which have recently been made with a view to secure the reward offered by Government for the discovery of "payable" quartz at a greater depth than 800 feet will remove an impression which had a tendency to prevent the proper development of our quartz veins. If the payment of the reward have the effect of removing an erroneous opinion, so prejudicial to quartz-mining, the money will be well spent.

Two Companies at Adelong are reported to have reached the required depth, but one of them, owing perhaps to a fault in the vein, has not yet found gold: the other, the Great Victoria Company, has claimed the reward. That claim is now being carefully investigated by this Department, and there is no probability of the reward being paid until the Company's claim to it has been established beyond all possibility of doubt.

Should the Great Victoria Company succeed in establishing their claim to the reward an important point will have been gained, inasmuch as it will have been proved that, in that part of the Colony at any rate, deep quartz-mining will pay.

It may be objected that it does not follow that quartz veins in other localities will pay below a given depth because the vein in a particular claim at Adelong has proved payable at a greater depth. The truth of this may be admitted, and it may even be conceded that perhaps some veins do not contain gold below a certain limited depth; but it remains a fact that neither here nor elsewhere has the depth below which gold ceases to exist in payable quantities yet been reached.

Mr. A. R. C. Selwyn, F.G.S., the Director of the Geological Survey of Canada, and formerly of Victoria, speaking of the permanence in depth of veins, says:—

The depth to which mining can be successfully carried is, under any circumstances, so infinitesimally small when compared with the distances through which the forces, supposed to be the cause of the vein-fissures must have operated, that there need be no apprehension of the limit of the latter in depth being reached at distances less than those through which we know them (from surface evidence) to extend horizontally in directions parallel and transverse to the anticlinal axes; and as these distances are reckoned by thousands of feet, it may very safely be conjectured that there is practically no limit to the depth to which the leads may be successfully followed.

It affords me much pleasure to invite your attention to the reports furnished by the Wardens, some of which are especially interesting, and contain most valuable information respecting the Mining Districts. The Wardens in some cases are prevented by other duties from devoting to the collection and compilation of information concerning the mineral resources of the districts under their charge, that time and attention which the proper performance of the work demands; but they all evince the utmost readiness to contribute such information as they possess.

The following tables show a comparison between the returns of gold for the past year furnished by the Mint and by the Mining Registrars, and a comparison between the Mining Registrars' returns for 1875 and 1876.

RETURNS of Gold for 1876 from the Mint and the Mining Registrars' compared.

	Mint.	Mining Registrars.	Excess.	Deficiency.
	ozs.	ozs.	ozs.	ozs.
Bathurst	15,877	15,514	363	.....
Tambaroora and Turon	30,749	30,124	625	.....
Mudgee	23,962	34,646	.....	10,684
Lachlan	25,461	40,598	.....	15,137
Southern	11,936	11,832	104	.....
Tumut and Adelong	18,995	21,326	.....	2,331
Peel and Uralla	5,341	9,478	.....	4,137
New England and Clarence .....	.....	3,893	.....	3,893
Locality unknown	21,210	.....	21,210	.....
			22,302	36,182
The quantity returned by the Mining Registrars exceeds the quantity sent to the Mint by			13,880	
			36,182	

MINING REGISTRARS, Returns of Gold for 1875 and 1876 compared.

	1875.	1876.	Increase.	Decrease.
	ozs.	ozs.	ozs.	ozs.
Bathurst	19,124	15,514	.....	3,610
Tambaroora and Turon	45,844	30,124	.....	15,720
Mudgee	36,024	34,646	.....	1,378
Lachlan	83,674	40,598	.....	43,076
Southern	7,169	11,832	4,663	.....
Tumut and Adelong	20,741	21,326	585	.....
Peel and Uralla	3,670	9,478	5,808	.....
New England and Clarence	1,963	3,893	2,030	.....
	218,109	167,411	13,086	63,784
		Less increase		13,086
		Decrease in yield for 1876		50,698

It will be seen that the returns furnished on this occasion by the Mining Registrars do not approach so nearly to those furnished by the Mint as did the returns of the previous year, but the quantity in the Mining Registrars' reports exceeds the quantities of gold imported into the Mint and exported from the Colony, combined, by 10,870 ozs. Although this result indicates a marked improvement in the reports furnished by the Mining Registrars, they are evidently still incomplete.

This remark must not be regarded as a reflection upon the labours of the officers who furnish the returns, many of whom are deserving of the highest praise for the industry and ability displayed, and all of whom, I am convinced, are most anxious to furnish complete and accurate information. But the difficulty lies in the first place in reaching the whole of the miners for the purpose of collecting the facts from them, and in the second place in inducing them to supply the facts.

In many cases the miners are of opinion that the publication of information respecting the result of their operations will prove prejudicial to them, though it is hard to comprehend how they can be prejudiced thereby; still the opinion exists, and the officers have to overcome it as best they can. In Victoria, where as a rule the fullest information is readily supplied, no instance can be cited of any miner or Company having been injured through the publication of statistics respecting the mines.

In many cases I believe the miners are unable to afford exact information, because they keep no account of the quantity of earth treated or of the gold won. If they could be got to see how much good they might do, at so little trouble and no risk to themselves, they would certainly be induced to note down facts from time to time, and at the end of each year, or when leaving the locality, send the result to the Mining Registrar of the district.

If a gold-miner is not successful, the publication of the result of his operations cannot injure him, and he may be benefited by the publication of the results obtained by others. If he is successful, the publication of the fact may cause an influx of miners to the locality ; but so long as his title be secure he will not be injured thereby—indeed he may be benefited, because the probability is that the new comers will make discoveries which he, single-handed, would not be likely to make, or to make so soon ; and though they may in the first instance derive an advantage by his discovery, he may subsequently benefit by their labours.

The quantity of gold won in 1876, according to the returns furnished by the Mining Registrars, is equal to 19 oz. 18 dwts. 17·8 grs. for each miner employed ; consequently, the average earnings in that year exceeds the average in 1875 by 5 ozs. 1 dwt. 21·18 grs., being an increase of more than 34 per cent.

The quantity of gold obtained from certain parcels of wash-dirt, according to the returns furnished by the Mining Registrars, for the year 1875, gave an average yield per ton equal to 5 dwts. 9·58 grs., while the returns for the past year give an average of only 1 dwt. 23·14 grs. per ton. But the returns for the former year included parcels amounting in the aggregate to only 58,081 tons, and the greater part of that was dirt that had been puddled ; whereas the returns for 1876 include parcels amounting in the aggregate to 172,630 tons, a large proportion of which has been merely sluiced, so that a much smaller average yield would pay for working. The highest yield per ton obtained in 1875 was 10 dwts., while the highest yield in 1876 was 2 ozs. 12 dwt. 12·00 grs. per ton. The lowest yield in 1875 was 4 grs. per ton, while in 1876 it was ·95 grs. per ton.

I have not been able to learn the average yield in Victoria for last year, but the average for the third quarter of that year was 20·11 grs. per ton, being 1 dwt. 3·3 grs. per ton less than our average for last year. The fact that our returns from Gulgong for last year represent only 16,661 tons against 41,500 tons for the previous year has tended greatly to reduce our average.

COMPARATIVE Statement of returns from Alluvial Mines for 1875-6.

1875.				1876.			
District.	Quantity.	Average per ton.	Yield of Gold.	District.	Quantity.	Average per ton.	Yield of Gold.
	tons.	ozs. dwts. grs.	ozs. dwts. grs.		tons.	ozs. dwts. grs.	ozs. dwts. grs.
Bathurst	105	0 8 22·85	47 0 0	Bathurst	24,484	0 0 22·09	1,126 16 0
Mudgee	53,289	0 5 6·71	14,067 15 22	Mudgee	44,774	0 2 12·61	5,653 16 23
Lachlan	4,687	0 6 16·29	1,565 5 0	Lachlan	9,148	1 0 1·18	9,170 10 14
				Southern	14,224	0 0 19·58	580 5 20
				Tumut & Adelaide long.	79,200	0 0 1·18	194 16 0
				Peel & Uralla	600	0 2 16·00	80 0 0
				New England & Clarence.	200	0 15 0·00	150 0 0
Total	58,081	0 5 9·58	15,680 0 22	Total	172,630	0 1 23·14	16,956 5 9

The average obtained from certain parcels of quartz crushed in 1875, according to the returns furnished by the Mining Registrars, was 1 oz. 4 dwt. 4·4 grs. per ton; but the aggregate of the parcels for that year amounted to only 10,609 tons. The returns for 1876 include parcels amounting in the aggregate to 53,211 tons, and the average yield is 13 dwts. 8·20 grs. per ton. The highest yield per ton in 1875 was 17 ozs., and in 1876 18 ozs.; but the smallness of these parcels suggest that they were picked stone. The lowest yield in 1875 was 1 dwt. per ton, and the lowest in 1876 was 1 dwt. 4·8 grs. per ton.

COMPARATIVE Statement of returns from Quartz Mines, for 1875-6.

1875.

1876.

District.	Quantity.	Average per Ton.	Yield of Gold.	District.	Quantity.	Average per Ton.	Yield of Gold.
	tons. cwt. grs.	ozs. dwts. grs.	ozs. dwts. grs.		tons. cwt. grs.	ozs. dwts. grs.	ozs. dwts. grs.
Bathurst	828 10 0	1 0 21·80	865 16 0	Bathurst	26,365 0 0	0 8 10·87	11,143 5 21
Tambaroora and Turon	1,647 2 0	1 18 22·47	3,206 12 0	Tambaroora and Turon	5,320 10 0	1 10 19·27	8,194 9 1
Mudgee	1,036 0 0	0 13 1·87	677 8 18	Mudgee	10,616 0 0	0 8 1·33	4,276 0 0
Lachlan	2,440 0 0	0 8 15·95	1,067 1 10	Lachlan	330 0 0	0 10 23·27	181 0 0
Southern	10 0 0	1 5 0	12 10 0	Southern	506 10 0	0 12 22·68	327 17 0
Tumut and Adelong	3,906 4 0	1 12 14·38	6,464 16 7	Tumut and Adelong	8,975 0 0	1 1 11·93	9,646 18 2
Peel and Uralla	424 0 0	0 18 12·50	392 13 0	Peel and Uralla	365 0 0	3 3 15·93	1,161 17 8
New England and Clarence	258 0 0	0 11 19·02	152 2 12	New England and Clarence	733 0 0	0 15 10·05	565 2 0
Total	10,609 16 0	1 4 4·4	12,820 0 8	Total	53,211 0 0	0 13 8·20	35,496 9 8

The latest report of the Victorian Department of Mines in my possession, namely, for the quarter ending September 30th, 1876, gives the average yield from quartz at 9 dwts. 18·43 grs. per ton, which is 3 dwts. 13·77 grs. below our average for last year. Some of the largest parcels of quartz, in the returns furnished by the Mining Registrars, were taken from very large bodies of stone, consequently a comparatively small average yield could be made to pay.

During the latter part of the year Mr. Masters, a gentleman who has had very large experience in the treatment of pyrites both in New Zealand and Victoria, came to this Colony with a view to establish works for the extraction of gold from pyrites, if he can find a suitable field for his operations. This gentleman first visited the Braidwood district, where he made a number of tests, but there was not sufficient payable pyrites then in view or being mined to induce him to erect a plant in that district. He is now in the Western District, and expects there to find a suitable field for his operations. It will be a great boon to the quartz-miner if a really competent man can be induced to erect in this Colony suitable works for the treatment of some of our waste products. The following table gives the results of the assays made by Mr. Masters of samples of pyrites, &c., in the Braidwood District, and following the table is a list of assays of minerals from the Forest diggings in the Bathurst District. Mr. Masters has kindly promised to furnish me with reports from time to time of his operations in other districts.

List of Assays made by Mr. John Masters in the Braidwood District.

No.	Locality.	Material.	Gold.	Silver.
			ozs. dwts. gr.	ozs. dwts. gr.
1	Snail's Reef (Fillo's claim) Ore crushed at Wilson & Co.'s machine and fairly sampled	Ore	1 2 20	5 17 19
2	Fair sample taken from old machine site, near Wilson's machine	Pyrites	0 16 8	8 19 16
3	Sample got out of trench specially by H. & O. J. Wilson in the presence of Mr. Masters, from Cahill's old claim	Pyrites	0 9 19	3 11 20
4	From Cahill's claim	Stone	0 6 12	4 1 16
5	From Dargue's Reef, picked up on surface of claim	Stone	0 9 19	2 15 12
6	From Wilson & Co.'s claim	Stone and pyrites in large cubes	0 9 19	4 1 16
7	Taken from trench at Shingle Hut Reef	Crushed stone..	0 6 12	0 19 14
8	From the Big Blow	Pyrites and crushed stone..	0 13 1	5 17 14
9	From reef in creek near Wilson & Co.'s machine	Clean pyrites..	4 1 16	15 10 8
10	From bin at old machine.....	Roasted pyrites which had been washed	1 2 20	0 16 8
11	From the slab paddock at Dargue's plant.....	Pyrites highly concentrated...	3 5 8	4 1 16
12	From the machine with furnace.....	Waste which had been roasted and passed through Chilean mill ...	4 1 16	Trace only.
13	Sideling Reef, Araluen, taken from the solid reef by Mr. Masters.....	Solid pyrites ...	Trace only	.....
14	From Nithsdale, given for assay by John Wallace, Esq.....	Stone	Trace only	1 15 22
15	From Oranmier Creek, given for assay by John Wallace, Esq.....	Stone	0 6 6	1 19 4
16	Lead ore, found by Mrs. Norris, at Major's Creek	Lead ore, containing 65 per cent. of lead.	Gold trace	13 17 16
17	Bell's Creek, sample is highly charged with mercury	Blanketings ...	0 6 12	3 8 14
18	Bell's Creek	Pyrites	0 9 19	3 11 20
19	Bell's Creek, Lady Belmore Reef (Hughes and White's claim)	Pyrites	6 10 16	13 1 8
20	Bell's Creek, at machine site	Pyrites	2 18 19	3 11 20
21	Bell's Creek, heap at foot of shoot.....	Pyrites	0 6 12	3 5 8
22	Bell's Creek, heap at foot of shoot further down.....	Pyrites	0 6 12	2 12 6
23	From ten tons of stone from Dargue's Reef, taken specially for testing—taken fairly across the reef, about 18 feet in width; this stone gives about ten per cent. of pyrites.....	Pyrites	0 13 1	9 6 4
24	From creek near Wilson and Co.'s machine	Vein pyrites...	0 16 8	0 19 14

List of Assays made by Mr. Masters of Minerals from the Forest diggings, Bathurst District.

Burnt Yards Claim.

No. 1. This claim is situated in the Forest, and is called the Burnt Yards Claim. The assay was fairly taken from a heap of about ten tons of pyrites, thought by the owners of the claim to be very valuable.

In all cases the assay represents the value of gold and silver in one ton of the mineral of (2,240) two thousand two hundred and forty pounds.

	ozs. dwts. gr.	Money value.	Total value per ton.
Gold.....	1 12 6	£6 15 5	£8 18 8
Silver	10 15 14	2 3 3	

No. 2. Sample taken from about four tons of highly concentrated pyrites from the claim of E. O'Shea, Esq., Belubula River, near the Junction Company's ground, Forest. These pyrites are also thought by the proprietor to be very valuable.

	ozs. dwts. gr.	Money value.	Total value per ton.
Gold.....	2 2 11	£8 18 3	£9 9 5
Silver	2 15 12	0 11 2	

No. 3. Clean dressed pyrites from the claim close to the Forest Reef machine; the pyrites can be got in very large quantities; the claim and machine are on the private property of — Stewart, Esq., near Bathurst.

	ozs. dwts. grs.	Money value.	Total value per ton.
Gold.....	0 6 12	£1 7 3 }	£1 10 0
Silver	0 13 1	0 2 9 }	

No. 4. Pyritous tailings taken from the tailings heap and assayed in bulk, No. 1, Osborn's paddock, Forest Reef.

	ozs. dwts. grs.	Money value.	Total value per ton.
Gold.....	0 9 19	£2 1 0 }	£2 4 11
Silver	0 19 14	0 3 11 }	

No. 5. Clean pyritous tailings from the same claim as No. 4, but not mixed with other tailings.

	ozs. dwts. grs.	Money value.	Total value per ton.
Gold.....	0 13 1	£2 14 9 }	£2 16 0
Silver	0 6 12	0 1 3 }	

No. 6. Sample of solid pyrites from the Forest Reef claim just above Stewart's machine, but not the same reef as No. 3 sample was taken from.

	ozs. dwts. grs.	Money value.	Total value per ton.
Gold.....	0 9 19	£2 1 0 }	£2 1 7½
Silver	0 3 6	0 0 7½ }	

No. 7. Pieces of dark stone, Old Forest Reef, Forest. This reef is a well defined one, and can be traced for a very long distance and is several feet thick.

	ozs. dwts. grs.	Money value.	Total value per ton.
Gold.....	0 6 12	£1 7 3	£1 7 3
Silver, trace only.			

No. 8. A number of pieces of stone from the Old Forest Reef, taken a quarter of a mile from those taken for No. 7 assay, but from the same reef.

	ozs. dwts. grs.	Money value.	Total value per ton.
Gold.....	0 9 19	£2 1 0	£2 1 0
Silver, trace only.			

No. 9. Sample of very fine-looking pyritous stone taken for assay by Hugh Murphy, from the bank of the Belubula River, near the claim of E. O'Shea, Esq.

	ozs. dwts. grs.	Total money value per ton.
Gold.....	0 6 12	£1 7 3
Silver, trace only.		

No. 10. Several pieces of stone taken from No. 1 North Prospector's Claim, Burnt Yards Forest. This claim is abandoned, but is well worthy the attention of prospecting miners—the adjoining ground has been very rich.

	ozs. dwts. grs.	Money value.	Total value per ton.
Gold.....	0 6 12	£1 7 3	£1 7 3
Silver, trace only.			

No. 11. Pyritous stone from the Frenchman's claim, Belubula River. This assay was made from several pieces highly charged with pyrites.

	ozs. dwts. grs.	Money value.	Total value per ton.
Gold.....	0 3 6	£0 13 7½ }	£0 17 0
Silver	0 16 8	0 3 4½ }	

No. 12. Stone from point of hill near the Frenchman's claim, opposite the Junction Company's ground, Belubula River.

Gold, trace only.
Silver, none.

No. 13. Pyritous stone from the claim of E. O'Shea, Esq., Belubula River.

	ozs. dwts. grs.	Money value.	Total value per ton.
Gold.....	0 6 12	£1 7 3	£1 7 3
Silver, trace only.			

No. 14. Pyritous stone from higher up the hill, and not the same vein as No. 13. This stone is no use for treatment in bulk—it must be crushed and concentrated to be of commercial value.

	ozs. dwts. grs.	Money value.	Total value.
Gold.....	0 3 6	£0 13 7½	£0 13 7½
Silver, trace only.			

No. 15. Sample of pyrites taken with the point of a knife from a vein in the Frenchman's claim, Belubula River.

	ozs. dwts. grs.	Money value.	Total value per ton.
Gold.....	0 13 1	£2 14 9 }	£2 16s.
Silver	0 6 12	0 1 3 }	

No. 16. Sample of crushing stuff from the Junction, Belubula River, 22 miles from Orange. This Company has a splendid property.

	ozs. dwts. gra.	Money value.	Total value per ton.
Gold.....	0 3 6	£0 13 7½ }	£0 15 7½
Silver	0 9 19	0 2 0 }	

No. 17. This sample of pyrites is part of a large sample given for assay by Thos. Walters, of Bathurst. These pyrites are to be had in great abundance, and can be delivered in Bathurst at £1 a ton; some of the samples are very rich in copper. This sample contained a good show of copper.

	ozs. dwts. gra.	Money value.	Total value per ton.
Gold.....	0 9 19	£2 1 0 }	£2 3 0
Silver	0 9 19	0 2 0 }	

No. 18. Part of the above from Bathurst, but nearly clean. Iron pyrites without copper.

	ozs. dwts. gra.	Money value.	Total value per ton.
Gold.....	0 6 12	£1 7 3 }	£1 10 6
Silver	0 16 8	0 3 3 }	

No. 19. Part of parcel reported No. 17. No copper. Poor-looking pyrites from near Bathurst.

	ozs. dwts. gra.	Money value.
Gold.....	0 6 12	£1 7 3
Silver, trace only.		

Mr. Augustus Morris has communicated the interesting fact that it is proposed to erect in Sydney a Fryer furnace for the treatment of gold- and silver-bearing ores. As will be seen from the following extract, the owners appear to have complete confidence in the furnace, and if it prove a success it will supply a want long and seriously felt in this Colony—

The owners of the Fryer Furnace, by which the most refractory gold and silver-bearing ores can be treated with excellent results and most inexpensively, intend to commence operations in this country. They propose to erect a furnace in Sydney, so that ores from all the Colonies may be tested, and when their invention is approved and adopted, remuneration will only be expected from results.

The owners of reefs rich in the precious metals, but too rebellious to yield their stores to the ordinary processes will be able to form their own judgments, but I have every reason to believe that the Fryer method will accomplish all that can be desired.

INSPECTION OF MINES.

The Regulations which came into force during the year for the Inspection and Regulation of Mines have given general satisfaction, especially in those localities where they are most needed, and there can be little doubt that, as administered by Mr. Slee, the Inspector of Mines, they will have a most beneficial effect in regard to the construction of mine works, and the reduction of the number of preventable accidents. I also anticipate that great improvements will be made in the appliances in use for the reduction of quartz, and the saving of gold at many of our mines, if the miners will only avail themselves of the judicious advice which Mr. Slee's experience and ability enable him to offer.

COAL.

Notwithstanding complaints of depression in the coal trade during the past year, the total output of the collieries is very little less than during the year 1875; and, as will be seen by reference to the table below, the quantities of coal consumed in this Colony and shipped to Intercolonial ports respectively, were greater in 1876 than during any previous year; the decrease is in our exports to British and Foreign ports, which is readily accounted for by the state of the coal trade in England, America, and elsewhere.

I regret to say that some of the returns for 1875, supposed to be for the whole year, were in fact for only six months, and the error was not detected until too late for correction; consequently the output of coal for that year was made to appear in my last Report less than the output of 1874, whereas it should have been larger by 25,162 tons; and the quantity of shale was from the same cause set down at less than it should have been.

In June last the new Coal Mines Regulation Act came into operation, and under it there is reason to believe the returns will be furnished in such a manner as will prevent a recurrence of such errors.

Under that Act the owners of collieries are not compelled to make the returns before the 1st of April, but in order to enable the Department to issue its Report at an earlier date they have very courteously furnished the returns before the prescribed date.

I submit for the information of those interested a table showing the average price per ton realized during each year from 1829 to 1857 inclusive:—

QUANTITY and value of Coal raised from 1829 to 1857 inclusive.

Year.	Quantity.	Average per ton.	Value.	Year.	Quantity.	Average per ton.	Value.
		£ s. d.	£			£ s. d.	£
1829	780	0 10 1·23	394	1845	22,324	0 7 10·27	8,760
1830	4,000	0 9 0·00	1,800	1846	38,965	0 7 0·46	13,714
1831	5,000	0 8 0·00	2,000	1847	40,732	0 6 9·01	13,750
1832	6,000	0 7 0·00	2,100	1848	45,447	0 6 3·38	14,275
1833	328	0 7 6·73	124	1849	48,516	0 6 0·45	14,647
1834	8,490	0 8 10·00	3,750	1850	71,216	0 6 6·77	23,375
1835	12,392	0 8 10·19	5,433	1851	67,610	0 7 6·51	25,546
1836	12,646	0 9 1·06	5,747	1852	67,404	0 10 11·33	36,885
1837	16,063	0 9 8·81	7,828	1853	96,809	0 16 1·51	78,059
1838	17,220	0 9 9·06	8,399	1854	116,642	1 0 5·63	119,380
1839	21,283	0 9 9·73	10,441	1855	187,076	0 12 11·96	89,082
1840	30,256	0 10 10·86	16,498	1856	189,960	0 12 4·96	117,906
1841	34,841	0 12 0·00	20,905	1857	210,434	0 14 0·97	148,158
1842	39,900	0 12 0·00	23,940				
1843	25,862	0 12 6·54	16,222		1,411,334	0 11 11·10	841,540
1844	23,118	0 10 8·34	12,363				

With the exception of the year 1833, when only 328 tons appear to have been raised, the quantity, with slight fluctuations, rapidly increased year by year until the output of 1857, which was 260·78 times that of 1829. During that period of twenty-nine years the fluctuations in price were very great, the lowest price, namely in 1849, being only 6s. 0·45d. per ton, and the highest, namely in 1854, being £1 0s. 5·63d. per ton. The rise in the price of Coal from 1852 was evidently due to the Gold discovery, and although during the succeeding ten years the output increased very rapidly, the price was maintained at rates equal to or higher than the present average price.

I also give a table showing the quantities of Coal exported to Intercolonial and Foreign ports respectively, and the quantities consumed in the Colony during each year from 1858 to the present time, with the average prices obtained for exported Coal.

TABLES showing the quantities and average value per ton of Coal exported to Intercolonial and Foreign Ports respectively, the quantity of Coal consumed in this Colony, and the average price per ton of the total output of the Collieries from 1858 to 1876 inclusive.

Year.	Exports to Intercolonial Ports.			Exports to Foreign Ports.			Total Exports.			Home consumption.	Total output and Value.		
	Quantity.	Average per ton.	Value.	Quantity.	Average per ton.	Value.	Quantity.	Average per ton.	Value.		Quantity.	Average per ton.	Value.
	Tons.	£ s. d.	£	Tons.	£ s. d.	£	Tons.	£ s. d.	£	Tons.	Tons.	£ s. d.	£ s. d.
1858	101,488	0 15 1 87	76,824	12,089	1 0 1 85	12,192	113,577	0 15 8 05	88,066	102,870	216,897	0 14 11 84	162,162 0 0
1859	129,686	0 14 6 87	94,312	44,849	0 17 5 27	98,672	173,985	0 15 8 49	132,984	134,978	308,213	0 13 8 14	204,371 0 0
1860	140,188	0 14 10 85	104,471	98,694	0 16 11 10	79,200	233,877	0 15 8 57	188,761	134,985	308,802	0 12 8 36	226,493 0 0
1861	157,978	0 15 2 26	119,438	50,502	0 16 5 37	41,582	207,780	0 15 5 92	160,065	134,987	342,007	0 12 9 52	218,820 0 0
1862	196,427	0 15 0 55	147,019	113,365	0 17 4 34	98,408	308,782	0 15 10 75	245,422	167,740	470,522	0 12 9 73	306,234 0 0
1863	213,909	0 13 8 40	146,532	84,129	0 17 6 10	73,649	298,088	0 14 9 30	229,181	135,851	438,889	0 10 10 06	236,280 0 0
1864	238,539	0 10 8 74	146,199	88,927	0 14 10 40	66,289	372,466	0 11 4 91	212,468	176,546	549,012	0 9 10 10	270,171 0 0
1865	232,664	0 9 11 83	146,129	90,304	0 15 0 79	68,029	382,968	0 11 2 20	214,158	202,566	585,525	0 9 4 43	274,308 0 0
1866	344,194	0 9 2 08	150,175	108,711	0 14 4 53	141,413	540,905	0 11 1 37	300,688	238,383	774,238	0 8 4 44	324,049 0 0
1867	312,101	0 9 4 35	146,111	161,266	0 13 8 47	107,148	473,357	0 10 8 40	253,259	296,655	770,012	0 8 10 79	342,655 0 0
1868	329,052	0 9 5 76	155,975	213,084	0 12 5 29	136,236	548,086	0 10 7 06	292,201	406,105	954,231	0 8 9 08	417,809 0 0
1869	340,466	0 8 9 07	149,059	255,087	0 11 8 31	149,136	596,553	0 10 0 16	298,195	324,221	919,774	0 7 6 32	346,146 0 0
1870	335,564	0 8 6 02	142,056	242,825	0 10 3 57	125,025	578,389	0 9 3 07	287,081	290,175	868,564	0 7 3 54	316,836 0 0
1871	378,891	0 8 6 91	162,470	186,538	0 10 1 22	94,220	566,429	0 9 0 05	250,000	338,355	888,784	0 7 0 47	316,340 0 0
1872	384,052	0 8 8 11	170,947	275,068	0 9 11 46	136,914	660,110	0 9 2 42	307,861	348,316	1,012,426	0 7 9 02	396,198 0 0
1873	425,887	0 12 9 32	272,110	347,142	0 14 7 59	253,979	773,079	0 13 7 32	526,089	419,783	1,192,862	0 11 1 34	665,747 0 0
1874	467,589	0 13 8 30	380,119	405,442	0 15 4 76	312,123	872,980	0 14 5 31	632,247	431,587	1,304,567	0 12 1 37	790,224 0 0
1875	518,553	0 13 7 77	354,974	408,164	0 15 6 34	317,409	927,007	0 14 5 34	671,483	402,722	1,329,729	0 12 3 39	819,429 17 2
1876	542,862	0 13 8 46	372,045	325,865	0 15 6 45	253,166	868,317	0 14 4 70	625,211	451,101	1,319,918	0 12 2 06	863,300 5 6
Total	5,068,719	0 11 5 08	3,385,660	3,600,361	0 13 10 06	2,504,700	9,504,086	0 12 4 99	5,388,420	5,121,566	14,025,592	0 10 2 03	7,436,518 2 8

From the above table it will be seen that in 1858 our exports equalled one-half our total output; at present they equal nearly three-fourths. Our present output is 6·09 times that of 1858, while our home consumption is now 4·38 times that of 1858. During the same period our export trade has grown so rapidly that with Intercolonial ports it is now 5·34 times as great as it was in 1858, while our trade with Foreign ports is 27·06 times as great as it was in 1858. In the last-named year the quantity of Coal sent to Intercolonial ports was 8·42 times that sent to Foreign ports, now it is only 1·66 times as great.

In the absence of the necessary detailed information respecting the prices of round and small coal respectively, the averages in the tables are based upon the total output of coal.

The progress made in this important branch of mining must be regarded as eminently satisfactory; still, seeing that our supply of coal is comparatively unlimited, our output might with advantage be very largely increased.

Every means has been taken to make known the information we possess both as to the quantity and quality of our coal, and some very interesting facts would have been given in this Report but that Professor Liversidge, while engaged in some investigations undertaken by him at the request of this Department, had the misfortune to break an instrument which could not be replaced in this Colony.

There is reason to believe that the samples of coal and the information respecting our coal measures sent to the Exhibition at Philadelphia will in due time lead to a large increase in our coal trade with Foreign Countries.

As manufactories increase in this and the adjoining Colonies, as firewood becomes more scarce near centres of population, and as facilities for the transit of coal by rail and by water become greater, our home consumption and intercolonial trade must increase.

By reference to the very able report furnished by the Examiner of Coal Fields, it will be seen that the Coal Mines Regulation Act of 1876 is working satisfactorily. It is due to Mr. Lewis, the Inspector of Collieries, that I should notice the efficient manner in which he has performed his duties under that Act.

SHALE.

Owing to my inability to ascertain the quantity of shale raised from the Mount Kembla Mine in 1875, as stated in my Report for that year, a comparison could not be instituted between the return for that year and the return for 1874. The same cause prevents a fair comparison between the total quantities obtained in 1875 and 1876 respectively. As far, however, as the New South Wales Shale and Oil Company is concerned, they raised in 1875, 6,197 tons, valued at £15,500, while in 1876 they raised 15,598 tons, valued at £46,794, showing an increase in favour of 1876 of 9,401 tons.

The Mount Kembla Mine was not worked during last year; but arrangements have been made to re-commence work; and considering the rise in the price of oil, it may reasonably be expected that during the present year the total output will show a large increase on previous years.

During the past year the proprietors of the Joadga Shale Mine commenced to work their land at Joadga Creek, and raised therefrom 400 tons, valued at £1,200, making the total output of shale for 1876 15,998 tons, valued at £47,994.

Table showing the quantity and value of Kerosene Shale produced during the years 1865 to 1876 :—

Year.	Quantity.	Average price per ton.	Total value.
	Tons.	£ s. d.	£
1865	570	4 2 5·47	2,350
1866	2,770	2 18 10·48	8,154
1867	4,079	3 14 9·21	15,249
1868	16,952	2 17 7·11	48,816
1869	7,500	2 10 0·00	18,750
1870	8,580	3 4 3·18	27,570
1871	14,700	2 6 3·91	34,050
1872	11,040	2 11 11·91	28,700
1873	17,850	2 16 6·55	50,475
1874	12,100	2 5 1·48	27,300
1875	6,197	2 10 2·22	15,500
1876	15,998	3 0 0·00	47,994
Total.....	118,336	2 14 10·95	324,908

Omitting 1875, the return for which is known to be incomplete, the average annual output appears to be 10,194 tons, and the average price obtained on the total output is £2 14s. 10·95d. The table represents great fluctuations both in quantity and value. The return for 1876 appears to be satisfactory, inasmuch as the quantity raised is not only considerably above the average annual output, but it is the largest, with the exception of the years 1868 and 1873, and the price obtained exceeds the average on the aggregate output since 1865 by 5s. 1·05d. per ton.

TIN.

Though the quantity of tin and tin ore exported during 1876 is very much smaller than in 1875, as will be seen by the following Table, the value thereof exceeds the average annual value since the opening of the Tin Fields by £66,156.

TIN EXPORTED 1875-6.

1875.						1876.					
Ingots.		Ore.		Total.		Ingots.		Ore.		Total.	
Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.
6,058	£ 475,168	2,022	£ 86,143	8,080	£ 561,311	5,449½	£ 379,318	1,508½	£ 60,320	6,957½	£ 439,638

The quantities reported by the Mining Registrars last year exceed considerably the quantities reported during 1875, and the number of miners employed is also larger, as will be seen by reference to the following Table:—

1875.				1876.			
Locality.	No. of Miners	Ore.	Value.	Locality.	No. of Miners	Ore.	Value.
		Tons.	£			Tons.	£
Tingha	477	1,574	51,942	Tingha.....	500	2,300	69,000
Inverell.....	42	100	3,600	Glen Innes.....	120	1,000	30,000
Vegetable Creek	607	3,040	97,208	Vegetable Creek.....	625	3,008½	90,261
Tenterfield	384	1,560	62,400	Tenterfield	407	1,055½	40,352
Tumbarumba	12	134	6,700	Tumbarumba	2	12	660
Total	1,472	6,408	221,922	Tenterfield tin ingots.....	1,654	7,376½	230,273
					.....	390	22,440
				Total.....	.....	7,706½	252,713

In view of the fact that the returns furnished by the Mining Registrars are evidently incomplete, the quantity of tin and ore exported must be taken as the nearest approach to the quantity of ore obtained during the year. It is however most gratifying to find that the Mining Registrars evince much interest in this work, and it is hoped that they will ere long succeed in procuring complete returns.

The Mining Registrar at Vegetable Creek (Mr. G. H. Gower) has, in addition to a very interesting report, furnished a description and diagram of a tin-dressing machine constructed by Mr. W. H. Wesley (the Manager of the Great Britain Company's Mine), which is found to work very satisfactorily, and to effect a great saving of expense in extracting and cleaning the ore. He has also prepared a map of the Vegetable Creek Tin Field, showing the position of some of the principal mines, and containing a great deal of useful information respecting them. This map will doubtless prove exceedingly interesting, especially to those connected with the mines on that field. Mr. Gower also supplies a table showing the quantities of tin ore raised by a number of Companies during the years 1872 to 1876 inclusive; the total quantity being 10,892 tons 5 cwt. The reports furnished by this gentleman reflect the highest credit upon him, and I cannot sufficiently express my appreciation of his labours. The thanks of every one interested in tin-mining are due to Mr. Wesley for his untiring and disinterested efforts to improve the appliances for and reduce the cost of dressing tin ore. The success which has attended his efforts is due to his great experience and undoubted ability.

The decrease in the yield of tin ore during the past year is probably due to the fact that some of the creek beds which contained rich deposits easily reached have been exhausted; and the deeper deposits upon which (until our tin lodes shall be successfully opened up) the permanent prosperity of the Tin Fields mainly depends, have not yet been sufficiently developed. Moreover, some of the principal Companies have learned that it is more important to keep their prospecting works well ahead, with a view to ensure a steady supply of ore for some time

to come, than to rush out all the payable wash in sight and trust to chance for the further development of their mines. This has had the effect of reducing the yield for the time being, but it must tend to secure the permanence of these mines and thus prove advantageous.

The fluctuations in the price of tin, and the difficulties and expense attending the transport of the ore, has had a depressing effect upon this industry, but the skill and energy with which the tin-miners have sought to overcome these drawbacks, by the introduction of improved appliances and methods of working by which they may be enabled to raise and dress the ore at such a reduced price as will under adverse circumstances leave them a margin of profit, are deserving of the highest praise, and are the best guarantees of the future success of our tin mines.

Taking the returns furnished by the Mining Registrars for 1875 both as to the quantity of ore raised (which by the way is evidently quite below the mark) and the number of miners employed in getting it as the basis, the earnings of each miner for that year would appear to be £150 15s. 2·93d., while for 1876 the earnings of each miner (making no allowance for the cost of converting the ore into the 330 tons of ingots) would appear to be £152 15s. 9·35d., which is considerably greater than the average earnings of gold-miners either in this Colony or in Victoria. As a matter of fact, there is on the one hand always a considerable number of miners both on the Tin Fields and the Gold Fields who are engaged in work which is for the time being, if not altogether unproductive, such as sinking shafts, driving tunnels, building dams, cutting races, &c., &c.; and on the other hand, according to the above method of estimating the earnings of each miner no allowance is made for interest on capital invested in and wear and tear of plant and consumption of materials used in the mines and so forth. But as a rough approximation the estimate serves the purpose of comparison, because the omissions on the one hand and the other apply about equally to tin and gold mining.

COPPER.

The following table shows that the value of our exports under this head in 1876 is less than one-half the value of similar exports during 1875:—

1875.			1876.		
Copper.	Quantity.	Value.	Copper.	Quantity.	Value.
	tons cwt.	£		tons cwt.	£
Ingots	5,991 0	501,287	Ingots	3,106 9	248,142
Ore	254 0	7,491	Regulus	114 5	5,451
			Ore	55 6	1,385
Total	6,245 0	508,778	Total	3,276 0	249,978

Still, the exports in copper, &c., in 1876 exceed in value the annual average since 1858 by £167,544.

Although the returns furnished by the Mining Registrars do not include some important mines, still, so far as they go, they appear to indicate an improvement in this branch of mining which renders it somewhat difficult to account for the decrease in our yield of copper, as indicated by the Custom House Returns. To render these last-named returns really useful for

the purpose, it would be necessary to ascertain the quantity and value of the ore and metal in hand at the commencement and termination of the year ; but this would be more difficult of accomplishment than the collection of complete information as to the quantity of ore raised, smelted, &c. In the absence of more complete returns from the Mining Registrars, the quantity exported is the nearest approximation to the quantity raised.

During the year just ended an important copper mine has been opened on the Coombing Estate, and a considerable area of land has been taken up in several localities for copper-mining. In various parts of the Colony lodes were being prospected with a view to open them up, but the difficulty in many cases appears to be the great expense of bringing the ore to market, and the want of capital to erect furnaces, &c., and, in some cases, the want of skill to conduct the work of smelting and refining profitably.

Notwithstanding the apparent decrease in the yield of our copper mines, there is reason to believe that this branch of mining is progressing satisfactorily, and I feel confident the actual yield greatly exceeds that given in the returns.

The return kindly furnished by the Commissioner of Railways shows that 602 tons of refined copper were sent to Sydney from the Eskbank Smelting Works alone, and the quantity of copper brought down on the Southern line shows that our returns from the Southern mines are incomplete.

IRON.

In this important branch of mining the increase is very great ; indeed until last year we may be said to have done nothing, but there are now reasonable grounds for hoping that it will assume a position to which, considering the extent and richness of our deposits of ore and the facilities we possess for making the iron, it is entitled. During 1876 we exported 482 tons, valued at £3,444, against 40 tons, valued at £502, in 1875 ; while the quantity of pig iron made last year, according to the returns furnished, is 2,679 tons 17 cwt., valued at £13,399.

The bulk of this iron is from the Fitzroy Iron Works, where seventy men are now employed. It is stated that the quantity would be greatly increased but for the richness of the ore and the difficulty of obtaining poor ore to mix with it.

At the Lithgow Valley Iron Works only a small quantity of iron has been made, as the owners have been chiefly engaged in erecting the necessary furnaces, mills, &c., for converting their pig iron into malleable iron. When these works are complete we may expect a considerable addition to our production of iron. According to the Railway Returns, this Company sent 75 tons 6 cwt. of iron to Sydney during the year.

Mr. Augustus Morris, the Executive Commissioner to the Philadelphia Exhibition writing from New York, under date 23rd December last, says : " I would advise that no great works for smelting iron should be erected until the result of a new process discovered here is known. I am confident that very shortly the whole of the iron or steel rails required in Australia and New Zealand will be made in New South Wales."

Since Mr. Morris's return he has kindly communicated the following:—

"In anticipation of my formal report on the subject to the Government, I would state that I feel confident the products from the iron mines of the Colony will swell our exports enormously.

"Two processes have been invented in the United States by which iron and steel can be made more economically than by any former methods.

"One of these plans, which requires the use of about 3s. worth of chemicals to the ton of metal produced, enables the finest steel to be made direct from the furnace; and this steel is so good that it welds with iron without the slightest injury to either kind of material. Steel-headed rails of a quality never hitherto made is the result of this process. Specimens of this steel and iron in various forms will be shown at the Metropolitan Exhibition, and I am sure the qualities of them will be generally approved.

"This process does not require that the iron ores should be mixed in the smelting, but each can be treated alone.

"The other method makes iron of a quality so fine that Mr. Lothian Bell, M.P., on his return from Philadelphia to England, informed the workers in that metal it could be made into rails superior to Bessemer steel at a price not exceeding that of those produced from ordinary iron.

"The only obstacle to the complete success of this process consisted in the difficulty of handling great masses of heated iron after being puddled.

"Before I left Philadelphia, machinery had been invented which lifted and moved with the greatest ease glowing balls of iron weighing 12 cwt. each.

"If there are places where iron, coal, and lime are in close proximity, be assured that combined English and American capital will very soon be prepared to operate in this country. * * * I look forward with great interest to the early development of our iron mines, and to a greatly increased production of gold as potent means amongst others of increasing immigration into New South Wales and of maintaining at a high rate the wages of industrious workmen."

SILVER.

The quantity exported during 1876 is 69,179 ozs., valued at £15,456, against 52,553 ozs., valued at £12,794, in 1875, being an increase in quantity of 16,626 ozs., and in value £2,662.

LEAD.

There is no mention of this metal in the return kindly furnished to me by the Collector of Customs, but 13 tons of lead were brought by rail to Sydney during the year just ended.

ANTIMONY.

During the past year 6 tons 12 cwt. of ore, valued at £53, were exported, as against 142 tons of regulus, valued at £5,000, in 1875; but the Mining Registrars' returns show that from one mine alone 40 tons of ore, valued at £140, were sent to Sydney. During the year some new lodes have been prospected, but this branch of mining does not appear to command the attention it deserves; though from recent inquiries I am inclined to think it is likely soon to command more attention.

SUMMARY.

In conclusion, I beg to submit the following summary of the quantity and value of the several minerals produced to the 31st December last:—

	Quantity.	Value.	Total value.
		£ s. d.	£ s. d.
Quantity and value of gold raised prior to the 1st January, 1876	8,436,114.50 ozs.	31,413,940 8 6	
Quantity and value of gold raised during 1876	167,411.80 „	618,190 7 9	
Totals.....	8,603,526.30 „	32,027,130 16 3	32,027,130 16 3
Quantity and value of silver raised prior to the 1st January, 1876	333,791 ozs.	90,010 0 0	
Quantity and value of silver raised during 1876	69,179 „	15,466 0 0	
Totals.....	402,970 „	105,466 0 0	105,466 0 0
Quantity and value of coal raised prior to 1st January, 1876	14,717,008 tons.	7,474,767 17 2	
Quantity and value of coal raised during 1876.....	1,319,918 „	803,300 5 6	
Totals.....	16,036,926 „	8,278,068 2 8	8,278,068 2 8
Quantity and value of shale raised prior to 1st January, 1876	102,338 tons.	276,914 0 0	
Quantity and value of shale raised during 1876	15,998 „	47,994 0 0	
Totals.....	118,336 „	324,908 0 0	324,908 0 0
Quantity and value of tin raised prior to 1st January, 1876	Ingots—11,110 „ Ore— 8,623 „	1,427,772 0 0	
Quantity and value of tin raised during 1876	Ingots—5,449 „ Ore— 1,508 ½ „	439,638 0 0	
			1,867,410 0 0
Quantity and value of copper raised prior to 1st January, 1876	Ingots—12,819 „ Ore— 22,151 ½ „	1,316,254 0 0	
Quantity and value of copper raised during 1876	Ingots—3,106 ts. 9 cwt. Regulus 114 „ 5 „ Ore— 55 „ 6 „	249,978 0 0	
			1,566,232 0 0
Value of iron raised prior to 1st January, 1876		15,936 0 0	
Quantity and value of iron raised during 1876	2,679 tons 17 cwt.	13,399 0 0	29,335 0 0
Quantity and value of antimony raised prior to 1st January, 1876.....	Ore—72 tons.	5,897 0 0	
Quantity and value of antimony raised during 1876	Regulus 142 tons. Ore 40 tons.	140 0 0	6,037 0 0
Total value.....		£ 44,204,576 18 11	

Showing that the aggregate value of the minerals produced, so far as can be ascertained, amounts to £44,204,576 18s. 11d.

The summary also shows that the aggregate value of the mineral products of the Colony for the year 1876 amounts to £2,183,095 18s. 3d., which exceeds the decennial average, namely, £1,904,869 18s. 11.6d., by £278,725 14s. 3.4d.

I have, &c.,

Department of Mines,
Sydney, 5th March, 1877.

HARRIE WOOD,
Under Secretary for Mines.

TABLE showing approximately the number of Miners employed in Gold Mining, the quantity of Gold won, the area of ground worked, and the value of Machinery, in the Colony of New South Wales, during the year 1876.

District and Division.	Alluvial Miners.		Quartz Miners.		Total Miners.	Quantity of Gold.			Price of Gold per ounce.		Value of Gold won.	Alluvial ground worked.	Quartz Reeds proved to be auriferous.	Value of Machinery.
	Euro-peans.	Chinese.	Euro-peans.	Chinese.		Alluvial.	Quartz.	Total.	From.	To.				
BATHURST DISTRICT—	No.	No.	No.	No.	No.	ozs. dwt. grs.	ozs. dwt. grs.	ozs. dwt. grs.	s. d.	s. d.	£ s. d.	Square miles.	No.	£
Bathurst Division...	25	50	10	20	105	80 0 0	120 0 0	200 0 0	70/0	77/6	750 0 0	...	...	...
Trunkley " " "	68	3	22	...	93	1425 13 8	617 16 6	2043 9 14	...	...	7560 17 0	...	...	9100
Tuena " " "	30	50	4	...	84	950 0 0	...	950 0 0	72/6	75/0	3562 10 0	20	15	6150
Carroar " " "	8	20	142	...	170	348 13 8	3200 0 0	3548 13 8	62/0	70/0	11533 0 0	...	20	12000
Cowra " " "	20	...	...	...	20	177 0 0	...	177 0 0	76/6	80/0	700 0 0	1	...	...
Oberon " " "	3	...	5	...	8	...	28 0 0	28 0 0	72/0	72/0	100 16 0	1	3	1850
Rockley " " "	41	12	...	...	53	585 0 0	...	585 0 0	72/6	72/6	2120 12 6	...	...	...
Orange " " "	...	18	34	...	52	...	1384 0 0	1384 0 0	65/0	65/0	4498 0 0	...	...	5000
Mitchell's Creek Division.	18	23	30	...	71	470 0 0	6128 0 0	6598 0 0	40/0	74/0	16155 0 0	160	12	3700
TAMBOORA AND TROON DISTRICT—	213	176	247	20	656	4036 6 16	11477 16 6	15514 2 22	40/0	80/0	46980 15 6	182	50	37800
Troon Division...	151	185	276	2	614	3191 12 4	16284 5 16	19475 17 20	70/0	77/6	75469 1 7	40	40	45855
Hill End Division...	...	137	387	...	524	...	...	7053 12 7	68/0	76/10	25540 0 0	...	...	...
Sofala " " "	120	90	80	...	290	1752 6 8	1842 15 17	3595 2 1	69/0	76/0	13032 4 10	...	...	25000
Ironbarks " " "	271	412	743	2	1428	4943 18 12	18127 1 9	30124 12 4	68/0	77/6	114041 6 5	40	40	48355
MURREY DISTRICT—	476	20	4	...	500	...	...	18446 5 17	70/0	77/6	69634 9 0	9	7	9000
Gulgong Division...	31	10	6	1	48	6587 0 0	...	6587 0 0	75/0	77/6	25112 18 9	4	3	1000
Mudgee " " "	207	188	...	...	395	5219 18 21	...	5219 18 21	72/0	76/0	19574 15 9	40	10	500
Hargreaves " " "	...	18	83	...	101	116 14 1	4276 0 0	4392 14 1	60/0	76/0	15942 6 2	...	2	10000
Wellington " " "	714	236	93	1	1044	11923 12 22	4276 0 0	34645 18 15	60/0	77/6	130264 9 8	53	22	20500
LACHLAN DISTRICT—	40	2	18	...	60	400 0 0	150 0 0	550 0 0	70/6	72/6	2025 10 0	120	20	3500
Forbes Division...	450	...	50	...	500	10000 0 0	500 0 0	10500 0 0	74/0	76/0	39900 0 0	70	25	16000
Parkes " " "	1000	...	200	...	1200	23589 17 14	883 9 6	24473 6 20	74/6	74/6	90663 3 6	96	4	4000
M'Gaugha's Sub-Division.	40	...	30	...	70	1150 0 0	1500 0 0	2650 0 0	73/0	74/0	9738 15 0	2	30	...
Cargo Division...	25	...	40	...	65	423 0 0	981 5 0	1404 5 0	73/6	77/0	5265 18 9	...	22	7450
Grenfell " " "	200	50	...	...	250	1020 18 12	...	1020 18 12	74/0	76/0	3827 2 0	...	...	...
Young " " "	1755	52	338	...	2145	36583 16 2	4014 14 6	40598 10 8	70/6	77/0	151420 9 3	288	101	30950

TABLE showing approximately the number of Miners, &c.—continued.

District and Division.	Alluvial Miners.		Quartz Miners.		Total Miners.	Quantity of Gold.			Price of Gold per ounce.		Value of Gold won.	Alluvial ground worked.	Quartz reefs proved to be auriferous.	Value of Machinery.
	Euro-peans.	Chinese.	Euro-peans.	Chil-nese.		Alluvial.	Quartz.	Total.	From.	To.				
No.	No.	No.	No.	No.	oss. dwt. grs.	oss. dwt. grs.	oss. dwt. grs.	s. d.	s. d.	£ s. d.	Square miles.	No.	£	
SOUTHERN DISTRICT—														
Braidwood Division.	120	80	...	...	200	820 0 0	...	820 0 0	73/0	75/0	3050 0 0	10	...	10000
Araluen "	266	102	4	4	376	3988 6 0	211 14 0	4200 0 0	68/0	75/9	15802 10 0	...	...	8315
Major's Creek "	124	45	11	...	180	1825 9 0	114 2 0	1939 11 0	70/0	74/3	7173 8 0	...	15	1794
Little River "	150	145	...	...	295	2000 0 0	15 0 0	2015 0 0	77/0	77/0	7757 15 0	30	42	675
Nerrigundah "	52	46	...	...	98	806 2 6	26 0 0	832 2 6	78/6	78/6	3266 0 9	3	7	1400
Shoalhaven "	...	...	23	...	23	...	100 0 0	100 0 0	72/0	72/0	360 0 0	2	3	400
Moruya "	20	...	4	...	24	595 0 0	420 0 0	925 0 0	...	...	3216 3 9	...	...	2000
Bombala "	50	100	...	...	150	...	...	1000 0 0	75/0	78/0	3800 0 0	...	...	.....
TUMUT AND ADELONG DISTRICT—														
Adelong Division.	782	518	42	4	1346	9944 17 6	886 16 0	11831 13 6	68/0	78/6	44425 17 6	45	67	24584
Reedy Flat "	115	...	165	...	280	5000 0 0	10000 0 0	15000 0 0	72/0	76/0	55500 0 0	100	7	13000
Tumut "	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gundagai "	28	...	...	...	28	16 0 0	28 0 0	44 0 0	70/0	75/0	159 10 0	25	1	6000
Yass "	...	...	25	...	25	...	0 0 15	0 0 15	...	...	...	...	...	600
Tumbarumba "	285	39	54	...	378	2844 18 20	1425 16 10	4270 15 6	75/0	76/0	15549 2 5	25	10	3475
Kiandra "	70	100	6	...	176	1500 0 0	...	1500 0 0	71/0	72/0	5200 0 0	24	3	5000
Ten-mile Creek, "	10	10	10	...	30	...	...	...	76/0	80/6	...	8	...	5000
Albury "	7	...	7	...	14	100 0 0	200 0 0	300 0 0	78/0	79/0	1170 0 0	2	1	.....
Queanbeyan "	12	...	3	...	15	196 0 0	15 0 0	211 0 0	70/0	70/0	738 10 0	160	2	500
PEEL AND URALLA DISTRICT—														
Armidale Division.	527	149	270	...	946	9656 18 20	11669 11 10	21326 10 6	70/0	80/6	78317 2 5	3224	25	33575
Uralla "	45	10	10	...	65	...	...	433 16 12	74/6	75/6	1627 0 0	...	...	2350
Nundle "	110	60	...	...	170	1500 12 20	...	1500 12 20	75/6	76/0	5683 10 0	20	...	300
Scone "	74	68	18	...	160	1500 0 0	1200 0 0	2700 0 0	72/3	72/9	9787 10 0	...	10	7500
Barraba "	30	...	15	...	42	23 17 0	440 7 0	464 4 0	72/6	72/6	1653 14 6	...	5	2000
Bingers "	...	...	12	...	16	300 0 0	143 0 0	443 0 0	69/0	70/0	1550 10 0	32	4	880
Glen Innes "	12	4	...	...	16	...	...	500 0 0	72/0	...	1800 0 0	...	...	600
Walcha "	20	10	...	...	30	520 0 0	...	520 0 0	60/0	60/0	1560 0 0	50	...	100
Nowendoc "	...	...	8	...	8	...	...	1216 0 0	71/0	73/0	4355 12 6	2	2	3000
Barrington "	35	...	15	...	50	200 0 0	...	200 0 0	72/0	72/0	710 0 0	8	...	...
	349	152	78	...	579	4044 9 20	2999 7 0	9477 13 8	60/0	76/0	33977 17 0	112	21	16730

TABLE showing approximately the number of Miners, &c.—continued.

District and Division.	Alluvial Miners.		Quartz Miners.		Total Miners.	Quantity of Gold.			Price of Gold per ounce.		Value of Gold won.	Alluvial ground worked.	Quartz reefs proved to be auriferous.	Value of Machinery.
	Euro-peans.	Chinese.	Euro-peans.	Chi-nese.		Alluvial.	Quartz.	Total.	From.	To.				
No.	No.	No.	No.	No.	ozs. dwt. gra.	ozs. dwt. gra.	ozs. dwt. gra.	s. d.	s. d.	£ s. d.	Square miles.	No.	£	
NEW ENGLAND AND CLARENCE DISTRICT—														
Tenterfield Division ...	5	...	...	...	5	150 0 0	.....	150 0 0	72/0	...	540 0 0	...	...	150
Little River " .....	...	...	4	...	4	3 0 0	...	149 0 0	75/0	75/0	570 0 0	...	64	4000
Lunatic "	100	12	80	...	192	1368 3 0	911 0 0	2279 3 0	70/0	77/0	8122 7 0	...	20	1800
Solferino "	18	...	14	...	32	307 13 5	303 19 18	611 12 23	65/0	72/0	2080 3 0	...	21	3500
Ballina "	50	...	...	...	50	700 0 0	.....	700 0 0	70/0	...	2450 0 0	...	...	...
	173	12	98	...	283	2528 16 5	1363 19 18	3832 15 23	65/0	77/0	13762 10 0	328	105	9450

Summary.

TABLE showing approximately the number of Miners employed in Gold Mining, the quantity of Gold won, the area of ground worked, and the value of Machinery, in the Colony of New South Wales, during the year 1876.

District and Division.	Alluvial Miners.		Quartz Miners.		Total Miners.	Quantity of Gold.			Price of Gold per ounce.		Value of Gold won.	Alluvial ground worked.	Quartz reefs proved to be auriferous.	Value of Machinery.
	Euro-peans.	Chinese.	Euro-peans.	Chinese.		Alluvial.	Quartz.	Total.	From.	To.				
Bathurst District	No. 213	No. 176	No. 247	No. 20	No. 656	oss. dwt. grs. 4036 6 16	oss. dwt. grs. 11477 16 6	oss. dwt. grs. 15514 2 22	s. d. 40/0	s. d. 80/0	£ 46680 15 6	Square miles. 182	No. 50	£ 37800
Tambaroora and Turon District.	271	412	743	2	1428	4943 18 12	18127 1 9	30124 12 4	68/0	77/6	114041 6 5	40	40	48355
Mudgee District	714	236	93	1	1044	11923 12 22	4276 0 0	34645 18 15	60/0	77/6	130264 9 8	53	22	20500
Leachlan "	1755	52	338	...	2145	36583 16 2	4014 14 6	40598 10 8	70/6	77/0	151420 9 3	288	101	30950
Southern "	782	518	42	4	1346	9944 17 6	886 16 0	11831 13 6	68/0	78/6	44425 17 6	45	67	24584
Tumut and Adelong District.	527	149	270	...	946	9656 18 20	11669 11 10	21326 10 6	70/0	80/6	78317 2 5	322	25	33575
Peel and Uralla District	349	152	78	...	579	4044 9 20	2999 7 0	9477 13 8	60/0	76/0	33977 17 0	112	21	16730
New England and Clarence District.	173	12	98	...	283	2528 16 5	1363 19 18	3892 15 23	65/0	77/0	13762 10 0	328	105	9450
	4784	1707	1909	27	8427	83662 16 7	54815 6 1	167411 16 20	40/0	80/6	613190 7 9	1370	431	221944

TABLE showing approximately the number of Miners employed in mining for Minerals other than Gold or Coal, the quantity won during the year 1876, and the value of same, and the value of the plant.

Locality.	Miners employed	Quantities.				Value.	Value of Machinery.	Remarks.
		Tln.	Copper.	Iron.	Antimony.			
	No.	T. cwt. qrs.	T. cwt. qrs. lbs.	T. cwt. qrs.	T. cwt. qrs.	£ s. d.	£	
Bathurst	101	.....	3,045 0 0 0	.....	.....	9,246 5 0	.....	Ore.
Tuena	75	.....	350 0 0 0	.....	.....	17,500 0 0	3,000	Regulus.
Carcoar	60	.....	50 0 0 0	.....	.....	1,950 0 0	300	Regulus.
Oberon	20	.....	100 0 0 0	.....	.....	7,500 0 0	.....	Copper.
Rockley	8	.....	1,150 0 0 0	.....	.....	4,025 0 0	.....	Ore.
Orange	170	.....	22 2 3 12	.....	.....	1,660 0 0	.....	Copper.
Mitchell's Creek .....	.....	.....	225 0 0 0	.....	.....	15,750 0 0	.....	Copper.
Wellington .....	.....	.....	160 0 0 0	.....	.....	240 0 0	.....	Ore.
	434	.....	123 0 0 0	.....	.....	400 0 0	.....	Ore.
		.....	5,225 2 3 12	.....	.....	58,271 5 0	3,300	.
Tumbarumba	2	12 0 0	.....	.....	.....	660 0 0	.....
Tingha	500	2,300 0 0	.....	.....	.....	69,000 0 0	3,000	
Glen Innes	120	1,000 0 0	.....	.....	.....	30,000 0 0	100	
Tenterfield	407	1,065 16 0	.....	.....	.....	40,352 0 0	2,656	Ore.
Vegetable Creek	625	3,008 14 0	.....	.....	.....	22,440 0 0	.....	Metal.
	1,654	7,706 10 0	.....	.....	.....	90,261 0 0	7,600	
		.....	.....	.....	.....	252,713 0 0	13,356	
Berrima	70	.....	.....	2,600 0 0	.....	13,000 0 0	60,000	
Hartley .....	.....	.....	.....	76 6 0	.....	399 0 0	.....
Oberon .....	.....	.....	.....	4 11 0	.....	.....	.....
	70	.....	.....	2,679 17 0	.....	13,399 0 0	60,000	
Sofala	4	.....	.....	.....	40 0 0	140 0 0	.....	Ore.

The following information has been obtained by the Wardens and Mining Registrars respecting certain parcels of Wash-dirt which have been puddled, sluiced, or crushed during the year 1876, and the quantity of Gold produced therefrom.

District and Division.	Name of Company.	Locality.	Quantity.	Average yield of Gold per ton.	Total yield of Gold.	Depth of Workings.
BATHURST DISTRICT— Carcoar Division	C. Hendricks & Co.....	Lumpy Swamp.....	460 0 0	2 1 19'82	962 0 0	98 feet.
	C. Hustwick	Flyer's Creek	24 0 0	1 4 0'00	28 16 0	24 "
	Jarvis & Evans	"	10,000 0 0	0 0 2'88	60 0 0	12 to 22 ft.
	Jarvis & Sons	"	14,000 0 0	0 0 2'60	76 0 0	12 to 30 ft.
			24,484 0 0	0 0 22'09	1,126 16 0	
MURREE DISTRICT— Gulgong Division	Various Mines	Canadian	4,297 0 0	0 5 3'73	1,107 13 8	130 feet.
		Gulgong, Canadian, and Nil Desperandum	12,364 0 0	0 6 15'29	4,103 1 9	70 to 150 ft.
	Hargraves do.	Hargraves	3,600 0 0	0 0 5'50	41 5 0	surface.
	Bond	"	1,300 0 0	0 0 6'50	17 12 2	"
	Noonan	"	600 0 0	0 0 5'50	6 17 12	"
	Wakelin	"	2,000 0 0	0 0 5'00	20 16 16	"
	Loneragan	"	300 0 0	0 0 1'50	0 18 18	"
	Fahcy	"	2,600 0 0	0 0 6'00	32 10 0	"
	Joyner	"	2,100 0 0	0 0 5'00	21 17 12	"
	Winters	"	1,500 0 0	0 0 4'00	12 10 0	"
	Cassidy	"	2,600 0 0	0 0 6'00	32 10 0	"
	Houghton	"	1,560 0 0	0 0 7'00	22 15 0	"
	Bennett	"	300 0 0	0 0 6'00	3 15 0	"
	Barlow's	"	240 0 0	0 0 7'00	3 10 0	"
	M'Laughlan	"	1,500 0 0	0 0 6'00	18 15 0	"
	Milton	"	3,377 0 0	0 0 10'61	74 13 18	"
	Aldis	"	724 0 0	0 0 4'00	6 0 16	"
	M'Grath	Windeyer	212 0 0	0 0 4'00	1 15 8	"
	Hawkins	World's End	800 0 0	0 0 12'00	20 0 0	"
	Ambler	"	400 0 0	0 0 6'00	5 0 0	"
	Lovett's	Merco	600 0 0	0 0 8'00	10 0 0	"
	West	"	1,800 0 0	0 1 0'00	90 0 0	"
		Hargraves	44,774 0 0	0 2 12'61	5,653 16 23	"

Yield of Gold from Wash-dirt—continued.

District and Division.	Name of Company.	Locality.	Quantity.	Average yield of Gold per ton.	Total yield of Gold.	Depth of Workings.
LACONIAN DISTRICT— Greenville Division	M. Small & Co.	Lower Seven-mile	117 0 0	0 9 21'94	58 0 0	80 to 90 ft.
	Thirlwall & Co.	"	86 0 0	0 8 4'74	35 5 10	"
	John Gale & Co.	"	108 0 0	0 6 21'55	37 5 0	"
	Roddy, Bourke, & Co.	Upper Seven-mile	78 0 0	0 10 21'53	42 10 0	"
	Nicholas & Co.	Lower Seven-mile	75 0 0	0 14 0'00	52 10 0	"
	Horen & Adams	Quandong	219 0 0	0 9 0'43	98 15 0	160 to 170 ft.
	John Dodd	"	117 0 0	0 14 22'97	87 10 0	"
	Wilson & Co.	The Terrace	20 0 0	1 4 0'00	24 0 0	"
	Farrell & Co.	Wapping Butcher	2,200 0 0	0 14 0'65	1,543 0 0	45 to 70 ft.
	Carroll & Co.	"	1,200 0 0	1 6 16'00	1,600 0 0	"
	Jones & Co.	"	1,306 0 0	2 4 14'57	2,912 17 2	"
	Barlow & Co.	"	600 0 0	0 15 0'00	450 0 0	"
	Harrison's	Fairy Lead	1,400 0 0	0 9 22'28	695 0 0	"
	Barnett & Co.	"	1,390 0 0	0 15 9'49	1,070 0 0	"
	Murphy & Co.	Wapping Butcher	200 0 0	1 17 23'77	379 18 2	"
	Barlow & Co.	"	32 0 0	2 12 12'00	84 0 0	"
			9,148 0 0	1 0 1'18	9,170 10 14	
SOUTHERN DISTRICT— Araruen Division Major's Creek do.	Various Mines	Araruen	1,100 0 0	0 0 12'34	28 5 20	20 feet.
	Various Mines	Long Flat	1,040 0 0	0 0 10'15	22 0 0	surface to 9 ft.
		"	150 0 0	0 5 20'80	44 0 0	"
		"	1,560 0 0	0 0 8'00	26 0 0	"
		"	624 0 0	0 0 20'00	26 0 0	"
		"	620 0 0	0 0 19'35	25 0 0	"
		"	3,120 0 0	0 0 12'00	78 0 0	"
		"	3,120 0 0	0 0 9'23	60 0 0	"
		"	780 0 0	0 1 23'38	77 0 0	"
		"	620 0 0	0 0 19'35	25 0 0	"
		"	1,100 0 0	0 2 8'72	130 0 0	"
		"	390 0 0	0 2 0'00	39 0 0	"
			14,224 0 0	0 0 19'58	580 5 20	

Yield of Gold from Wash-dirt—*continued*.

District and Division.	Name of Company.	Locality.	Quantity.	Average yield of Gold per ton.	Total yield of Gold.	Depth of Working.
TUMUT AND ADELONG DISTRICT— Tumbarumba Division	George Lauener	Upper Tumbarumba...	tons cwts. grs.	ozs. dwts. grs.	ozs. dwts. grs.	
	William Serby	"	12,700 0 0	0 0 1'91	50 12 0	
	Gregory Sones & H. Fox...	"	22,000 0 0	0 0 1'21	55 15 0	
			44,500 0 0	0 0 0'95	88 9 0	
PEEL AND URALLA DISTRICT Barraba Division			79,200 0 0	0 0 1'18	194 16 0	
	Samuel Pike	Tea-tree Creek	600 0 0	0 2 15'00	80 0 0	3 ft. 6 in.
	Surface Hill	Poverty Point	200 0 0	0 15 0'00	150 0 0	54 feet.

Summary.

QUANTITY of Gold obtained from certain parcels of Wash-dirt puddled, sluiced, &c., during the Year 1876, showing the average yield of Gold per ton.

District and Division.	Quantity.	Average yield of Gold per ton.	Total yield of Gold.
Bathurst District	tons cwts. grs.	ozs. dwts. grs.	ozs. dwts. grs.
Mudgee District	24,484 0 0	0 0 22'09	1,126 16 0
Lachlan District	44,774 0 0	0 2 12'61	5,653 16 23
Southern District	9,148 0 0	1 0 1'18	9,170 10 14
Tumut and Adelong District	14,224 0 0	0 0 19'58	580 5 20
Peel and Uralla District	79,200 0 0	0 0 1'18	194 16 0
New England and Clarence District	600 0 0	0 2 16'00	80 0 0
	200 0 0	0 15 0'00	150 0 0
	172,630 0 0	0 1 23'14	16,956 5 9

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TAMBARORA AND TUBON

YIELD of Gold from Quartz—continued.

District and Division.	Name of Company.	Locality.	Quartz Crushed.		Average yield of Gold per ton.		Total yield of Gold.		Depth at which Quartz was obtained.
TAMARACORA AND TURON DISTRICT—continued.	Simpson & Co.	Hill End	tons.	cwt.	qrs.	ozs.	dwt.	grs.	.....
	Marshall Bros.	"	1	0	0	2	7	12 00	15 ft.
	Dragon	"	12	0	0	1	3	8 00	130 to 160 ft.
	Pymont & Co.	"	51	0	0	0	8	10 35	130 ft.
	Eureka	"	10	0	0	0	7	8 60	80 to 150 ft.
	Star of Peace	"	462	0	0	0	4	20 88	140 and 550 ft.
	Cornish	"	287	0	0	1	8	18 79	306 ft.
	Excelsior	"	45	0	0	1	11	22 40	310 "
	Dragon	"	8	0	0	6	19	3 00	35 to 60 ft.
	Fischer & Beard	"	48	0	0	2	12	1 12	.....
	Do.	"	481	0	0	2	4	6 10	.....
	Royal Standard	"	385	0	0	2	13	22 87	.....
	Royal Standard	"	362	0	0	1	11	9 47	.....
	Cock, Attwood	"	51	0	0	2	3	8 00	.....
	Brown's Co.	"	22	0	0	2	5	8 72	.....
	Monte Christo	"	33	0	0	1	3	15 27	.....
	Paxton	"	50	0	0	1	5	4 80	.....
	Carroll & Beard	"	30	10	0	2	10	5 50	.....
	Helaby & Co.	"	36	10	0	1	16	11 82	140 ft.
	Denman & Co.	"	331	0	0	1	2	12 61	.....
	Thackery & Co.	Hill End	7	0	0	2	0	0 00	200 ft.
	Denman & Co.	"	6	10	0	0	14	22 15	60 "
	Frenchman's	"	25	0	0	0	11	0 00	50 "
	Bowler & Co.	"	48	0	0	0	7	16 00	100 "
	Letcher	"	25	0	0	0	11	0 00	70 "
	Longton & Co.	"	55	0	0	1	16	19 20	.....
	Burns & Co.	"	16	0	0	3	0	0 00	150 ft.
	Roberts & Co.	"	13	0	0	6	14	14 76	150 "
	Williamson & Co.	"	21	0	0	0	9	0 00	40 ft.
	Sanden & Co.	"	29	0	0	0	5	0 00	30 "
	The Solitary	"	19	10	0	0	7	11 68	30 and 80 ft.
	Tribute Party	Blacksmith's Point	60	0	0	4	0	0 00	100 ft.
	Koh-i-noor	Big Oakley Creek	50	0	0	3	10	0 00	30 "
	Stringybark Reef	Wattle Flat	19	10	0	1	0	0 40	24 and 90 ft.
	Poor Man's	Stoney Creek	9	0	0	9	0	0 00	40 ft.
	Ironbarks	"	600	0	0	0	7	0 00	50 "
	.....	"	130	0	0	1	0	8 46	60 "
Sofala Division .....	.....	.....	5,320	10	0	1	10	19 27	.....
Lionbark Division .....	.....	.....	8,194	9	1	.....	.....	.....	.....

YIELD of Gold from Quartz—continued.

District and Division.	Name of Company.	Locality.	Quartz Crushed.		Average yield of Gold per ton.		Total yield of Gold.		Depth at which Quarts was obtained.
			tons.	cwt.	qrs.	ozs.	dwt.	grs.	
MURDOCH DISTRICT— Wellington Division	Various Mines	Mitchell's Creek	10,616	0	0	8	1'33	4,276	0 0 60 to 170 ft.
LACHLAN DISTRICT— Forbes Division	Stephens & Co.	Strickland's Reef	60	0	0	1	0	0'00	95 ft.
M'Guigan's Sub-division..	Wright & Co.	Victoria Gully	70	0	0	0	12	0'00	66 "
	Do.	"	180	0	0	0	8	0'00	"
	Do.	Welcome Reef	20	0	0	0	7	0'00	"
			330	0	0	0	10	23'27	181 0 0
SOUTHERN DISTRICT— Araluen Division	Various Mines	Bell's Creek	191	0	0	0	17	8'79	165 17 0 Surface to 50 ft.
Major's Creek Division ..	J.G.	"	21	10	0	1	9	10'60	31 13 0
	W. D. & Party	Calder's Flat	23	0	0	0	16	17'73	19 5 0
	J. D. & Sons	Red Hill	20	0	0	0	6	0'00	6 0 0
	H. H. R.	Major's Creek	23	0	0	0	14	2'08	16 4 0
	D. & H. & Party	"	32	0	0	0	15	5'25	24 7 0
Nerrigundah Division ...	Bailey & Co.	" Wild Reef, Wagonga	55	0	0	0	17	13'52	48 6 0
			141	0	0	0	2	7'31	16 5 0 20 to 30 ft.
			506	10	0	0	12	22'68	327 17 0
TUMBUK AND ADELONG DISTRICT— Adelong Division	Great Victoria G. M. Co.	Victoria Reef	1,622	0	0	1	11	6'62	2,536 10 0 730 ft.
	Annetts & Co.	"	241	0	0	4	7	13'24	1,055 0 0 600 "
	North Williams	Adelong	3,267	0	0	0	18	22'58	3,094 0 0 580 "
	Houtley & Co.	Donkey Hill	17	0	0	1	3	12'70	20 0 0 75 "
	North Caledonian ..	Adelong	46	0	0	0	13	1'04	30 0 0 150 "
	Various Mines	"	2,979	0	0	0	11	22'41	1,777 11 16 200 to 600 ft.
	Little Britain	Ournie	140	0	0	0	15	17'14	250 0 0 40 ft.
	Do.	"	70	0	0	1	18	20'55	136 0 0 50 "
	Perry, Dawson, & Co.	"	50	0	0	2	0	4'80	100 10 0 30 "
	Pilot Reef Co.	New Meragle	300	0	0	1	10	18'34	461 6 10 100 "
	Navada	Paddy's River	200	0	0	0	9	24'40	96 0 0 50 "
		Black Range	35	0	0	2	2	20'57	75 0 0 130 "
		Michalago	8	0	0	1	17	12'00	15 0 0 100 "
Albury Division	Navada G. M. Co.		8,975	0	0	1	1	11'93	9,646 18 2
Queanbeyan Division ...									

YIELD of Gold from Quartz—*continued*.

District and Division.	Name of Company.	Locality.	Quartz Crushed.	Average yield of Gold per ton.	Total yield of Gold.	Depth at which Quartz was obtained.
PEEL AND URALLA DISTRICT— TRIOT— Armida Division	A. Gallagher & Co.	Cameron's Creek	tons. cwt. qrs.	ozs. dwts. grs.	ozs. dwts. grs.	30 ft.
	Fuller's Reef G. M. Co.	"	12 0 0	1 13 8'00	20 0 0	100 and 220 ft.
	Scene Division	Black Mountain	74 0 0	2 2 16'00	157 17 8	145 ft.
	Barraba Division	Glen Morrison	50 0 0	1 0 0'00	50 0 0	100 "
	Walcha Division	Back Creek	154 0 0	5 15 14'02	895 0 0	20 and 35 ft.
Barrington Division	Hoare, Tossall, & Co.	Centennial Reef	25 0 0	7 4'80	9 0 0	15 "
	W. Butler & Co.	"	15 0 0	1 6 16'00	20 0 0	7 "
NEW ENGLAND AND CHAR- ENCOR DISTRICT— Dalmorton Division	Hoare & Gill	"	35 0 0	0 5 17'14	10 0 0	
	Various Mines	Dalmorton	365 0 0	3 3 15'93	1,161 17 8	
Lunatic Division	J. Shoober & Co.	Lunatic Hill	530 0 0	0 5 14'94	149 0 0	150 ft.
	J. M'Lean & Co.	Tooloom	28 0 0	3 4 6'85	90 0 0	154 "
Caledonian Co.	Hollingdale & Bedwell	Lunatic	26 0 0	1 9 5'53	38 0 0	200 "
	Alderman Reef	"	46 0 0	3 0 0'00	138 0 0	80 "
Forget-me-not	Chance it	Slaty Creek	10 0 0	2 11 4'80	25 12 0	30 "
	"	Lunatic	40 0 0	0 9 0'00	18 0 0	10 "
733 0 0	"	"	43 0 0	2 0 5'38	86 10 0	100 "
	"	"	10 0 0	2 0 0'00	20 0 0	20 "
733 0 0				0 15 10'05	565 2 0	

Summary.

QUANTITY of Gold obtained from certain parcels of quartz crushed during the year 1876, showing the average yield of gold per ton.

District and Division.	Quartz Crushed.	Average yield of Gold per ton.	Total yield of Gold.
Bathurst District	tons. cwt. qrs.	ozs. dwts. grs.	ozs. dwts. grs.
Tambaroom and Turon District	26,365 0 0	0 8 10'87	11,143 5 21
Mudgee District	5,320 10 0	1 10 19'27	8,194 9 1
Laachlan District	10,616 0 0	0 8 1'33	4,276 0 0
Southern District	330 0 0	0 10 23'27	181 0 0
Tumut and Adelong District	506 10 0	0 12 22'68	327 17 0
Peel and Uralla District	8,975 0 0	1 1 11'93	9,646 18 2
ew England and Clarence District	365 0 0	3 3 15'93	1,161 17 8
733 0 0		0 15 10'05	565 2 0
53,211 0 0		0 13 8'20	35,496 9 8

TABLE showing the width, dip, and strike of Quartz Reefs in some of the deepest Mines in the Colony, being worked during the year 1876, and the average yield of gold per ton.

District.	Division.	Name of Company.	Name of Reef.	Depth at which Quartz was got.	Quantity crushed.	Average yield of Gold per ton.	Width of Reef.	Dip of the Reef (from the horizon.)	Strike of the Reef. (Bearing.)
Bathurst	Carcoar	J. O. Phillips & Co.	Juncton	70 to 100	tons cwt. 2,000 0 19,650 0	ozs. dwts. gra. 0 1 4 8 0 2 14 90	22 ft. 60 ft.	Direction horizontal N.W.	E. & W.
	Orange	Brown's Creek Co.	Brown's Creek	100	1,000 0	0 6 0	2 ft.	E.	E. & W.
	Mitchell's Creek	Carcoar G. M. Co.	West's Reef	75	90 0	17 6 0	Irregular	45	E. & W.
		New Phoenix Co.	Jacknow	206	1,000 0	0 12 10 24	From 4 in. to 2 ft. 6 in.	56° 18' 14"	N. & S.
Tambaroora and Turon	Hill End	Uncle Tom	Dark Corner	170	20 10	0 12 10 24	3 in. to 12 in.	E.	"
		Homeward Bound	Paxton's	521	841 10	1 7 0	8 in.	71° 33' 55"	"
		Paxton's	Frenchman's	310	223 15	1 6 0	1 1/2 in.	63° 20' 6"	"
		Excelsior	Excelsior	308	17 10	9 0 0	1 1/2 in.	71° 33' 55"	"
	Hill End	Hickson, Creighton, and Beards	Hickson's	290	98 0	4 12 0	1 in. to 10 in.	E.	"
		Peep o' Day	Peep o' Day	230	65 0	5 3 0	1 ft. 6 in.	63° 20' 6"	"
		Fisher and Beards	Fisher's	331	1,125 0	2 8 11	1 ft. 8 in.	"	"
		Venus	Venus	210	102 10	0 11 0	2 in. to 8 in.	"	"
	Sofala	Cock, Atwood, and Dryer	Cock Atwood	190	98 0	1 4 0	6 in.	71° 33' 55"	"
		Lord Nelson	Lord Nelson	160	244 0	0 17 0	2 ft.	"	"
		Perseverance	United Reefers	180	55 0	2 17 0	2 in. to 10 in.	"	"
		Dragon	Dragon	150	323 0	1 5 0	6 in.	E.	"
Mudgee	Wellington	Star of Peace	Star of Peace	480, 160, 200, 530	854 0	2 10 0	1 ft. 3 in.	"	"
		Box Ridge	Box Ridge	100	150 0	3 10 0	6 in. to 8 in.	E.	"
		Shakespeare	Box Ridge Creek	100	130 0	1 0 8 46	1 ft. 6 in.	W.	"
		Sandon & Co.	Poor Man's	60	7,216 0	0 10 7 11	2 ft. 6 in.	E.	20° W. of N.
	Adelong	Mitchell's Creek	Victoria Reef	400	938 0	2 1 9 08	2 in. to 15 in.	E.	N.
		Victoria Research	do.	730	1,622 0	1 11 6 32	3 in. to 36 in.	E.	10° W. of N.
		Annetta & Co.	do.	600	241 0	4 7 13 24	1 ft.	E.	11 1/2° E. of S.
		Flagstaff	do.	812	3,267 0	9 18 22 58	4 ft.	E.	N. 5° 1/4° W.
	Tumbarumba	North Williams	Ournie	580	129 0	2 19 8 39	6 in. to 30 in.	E.	N. 5° 1/4° W.
		Peep o' Day Tribute	do.	84	300 0	1 10 13 34	2 in. to 12 in.	W.	6° W. of N.
		Pilot Reef Co.	Paddy's River	50	35 0	0 9 24 4	3 ft.	S.	E. 30° N.
		Navada	Black Range	130	8 0	2 2 20 57	9 in.	"	"
Peel and Uralla	Queenbeyan	Navada	Michalago	100	12 0	1 17 12	5 ft.	78° 41' 25"	"
	Armidale	A. Gallagher & Co.	Cameron's Creek	80	15 0	1 13 8	1 ft. 4 in.	nearly perpendicular	E. & W.
	Scone	Fuller's Reef G. M. Co.	Fuller's Reef	165 to 220	25 0	3 0 0	6 in.	"	40° W. of N.
	Barraba	do.	do.	"	34 0	2 0 0	6 in.	"	"
New England and Clarence	Walcha	Lambton Co.	Black Mountain	140	80 0	1 17 0	1 in. to 12 1/2 in.	80° 32' 17"	N.E.
	Tenterfield	Golden Star	Glen Morrison	100	154 0	5 15 14 02	10 in.	W.	W.N.W.
	Dalmorton	Surface Hill	Poverty Point	54	200 0	0 15 0	80 yards	"	E. & W.
	Lunatic	Tower Hill G. M. Co.	Perseverance	150	530 0	0 5 14 94	2 ft.	N.	N. & S.
		J. Shoober & Co.	Lunatic Hill	154	28 0	3 4 6 35	1 ft. 6 in.	"	E. & W.
		J. M'Lean & Co.	Pioneer	200	93 0	1 9 5 53	1 ft. 6 in.	N.	"

* Worked by both shafts and adits.

† A succession of veins.

‡ Lode and vein.

§ Lode.

¶ Veins.

TABLE showing Machinery, &c.—continued.

District and Division.	Quartz						Alluvial.										Remarks																
	Steam Engines employed in Crushing, &c.		Crushing Machines		Stamp-heads		Whims and Pulleys		Water Wheels		Derricks		Whips		Compound Cradles			Ropes and Tows		Water Wheels		Hydraulic Hoses		Pumps		Rulce Boxes		Derricks		Stamp-heads		Boring Machines	
	No.	Aggregate horse-power.	No.	Aggregate horse-power.	No.	Aggregate horse-power.	No.	Aggregate horse-power.	No.	Aggregate horse-power.	No.	Aggregate horse-power.	No.	Aggregate horse-power.	No.	Aggregate horse-power.		No.	Aggregate horse-power.	No.	Aggregate horse-power.	No.	Aggregate horse-power.	No.	Aggregate horse-power.	No.	Aggregate horse-power.	No.	Aggregate horse-power.	No.	Aggregate horse-power.	No.	Aggregate horse-power.
SOUTHERN DISTRICT— <i>continued.</i>																																	
Monrva	1	20	1	10	1																												
Grandaroo .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gunning	2	24	...	18	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TUMUT AND ADRIANO DISTRICT—																																	
Adelong	1	14	2	31	14	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Reedy Flat .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tumut	1	10	1	5	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gundagai .....	...	...	...	30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Yass	1	12	1	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tumbarumba	4	40	4	31	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kiandra .....	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ten-mile	4	58	...	32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Albury .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Queanbeyan .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
PEEL AND URALIA DISTRICT—																																	
Armidale	1	8	1	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Uralla .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nundle	2	30	6	36	1	4	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Scone	2	40	3	26	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bingera	1	15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Barraba	2	16	2	14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tingha .....	...	...	1	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Vegetable Creek .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Walcha .....	...	...	1	15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
NEW ENGLAND AND CHARLES DISTRICT.																																	
Tenterfield	2	30	2	14	7	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...</

The foregoing tables have been compiled from information supplied by the Wardens and Mining Registrars.

Department of Mines,

Sydney, 5th March, 1877.

HARRIE WOOD.

WARDENS' REPORTS.

BATHURST DISTRICT—BATHURST, OBERON, ROCKLEY, TRUNKY, AND TUENA DIVISIONS.

(*Mr. Warden Smith, P.M., Trunkey.*)

I HAVE the honor to inform you, that mining in the Divisions of Trunkey, Tuena, Oberon, Rockley, and Bathurst, within the Bathurst District, is far from remunerative, the miners making but low wages and capitalists getting no return. Quartz mining has almost ceased, and alluvial mining has been retarded by the drought that has lasted, I might say, for two years. Most of the alluvial is worked by sluicing, but to get enough water frequent rains are necessary.

Copper mining is more favourably looked upon by capitalists, and I have no doubt many good mines will be found in the districts of Tuena, Rockley, and Bathurst.

The Mining Registrar's report last year respecting "opals" caused some search to be made by a party organized for the purpose, but without any good results.

Trunkey.—Mining cannot get much lower unless it ceases altogether; not more than 100 men have been seeking for gold during the year, and the very dry weather has seriously retarded the alluvial miners' operations. The gold obtained probably does not exceed 1,680 ozs., being 1,080 ozs. alluvial and 600 ozs. quartz gold.

Tuena.—Like Trunkey is very dead, only about eighty-four persons mining for gold during 1876. The quantity of gold obtained was about 950 ozs. alluvial, not one quartz reef having been worked.

Peelwood copper mine is situated in this district, and is probably one of the richest in the Colony. The following information has been supplied by the manager, Mr. Williams:—"During the past year the mine has been sunk 120 feet diagonally, making a total depth of 420 feet from the surface; bearing of lode north and south, underlaying eastward at an angle of 45°. The lode contains copper, silver, lead, and zinc, and varies in thickness from 1 to 20 feet; throughout the mine there is an abundance of lead ore, containing a great deal of silver, which is smelted mixed with the copper ore, thus rendering the produce in regulus, which contains 40 to 50 per cent. of copper, 30 to 40 of lead, and from 100 to 130 ozs. of silver to the ton. The mine during 1876 has produced in regulus and lead 300 to 350 tons."

Oberon.—May be looked upon as an abandoned gold field; only twenty-eight miners' rights were issued in 1876. One gold lease was worked, but is now abandoned. All the miners have left, or sought other occupation. One copper mine has been worked. "The Wiseman," which has given employment to twenty miners, the prospects are not very encouraging.

Rockley.—Little change has taken place in this gold field; about fifty miners are working alluvial, and obtained in 1876 about 585 ozs. of alluvial gold. Two copper mines—the Apsley and Smith's—are in this district; the former yielded 20 tons of copper, valued at £1,500, and the latter copper valued at £160, during 1876.

Bathurst.—With the exception of Winter's lease at Mitchell's Creek little quartz mining is going on. This lease is represented as being very rich, having produced 6,602 ozs. of gold during 1876. Mineral leases, representing an area of 720 acres, have been applied for in this district.

The Cow Flat and other copper mines are in this division of Bathurst ward, and are worked with fair prospects. I cannot give any detailed results, particulars having been sent to the Registrar at Bathurst.

From careful inquiry I gather that 5,179 ozs. of gold represents the quantity obtained in the districts under my charge during 1876. I have no means of ascertaining the quantity of copper won during same period; this information can only be obtained from the legal managers or secretaries of the companies in Sydney. Local managers have, and I think justly so, an objection to supply information without authority obtained from head offices.

In conclusion, I can only add that miners generally consider the Bathurst District has not been fairly prospected, that there are thousands of acres of basalt ranges under which gold is known to be, but the question as to whether in payable quantities has not yet been decided; until these ranges are properly prospected the district cannot be considered as worked out.

BATHURST DISTRICT—ORANGE DIVISION.

(*Mr. Warden Lane, P.M., Orange.*)

MINING operations in my district during the past year have been about the same as the few preceding years. I have really nothing to report. If persons of capital were to speculate in the neighbourhood of Ophir I believe the results would be more than I feel disposed to compute. Ophir only requires developing.

At Cargo the Ironclad looks well, and I believe will prove a good reef. The other localities are not spoken of.

BATHURST DISTRICT—CARCOAR DIVISION.

(*Mr. Warden North, Carcoar.*)

IN forwarding you this my Annual Report upon the mining operations carried on in the Carcoar division of the Bathurst Mining District during the past year, I regret that I cannot say the prospects (as far as gold mining is concerned) have been encouraging.

The number of miners has greatly decreased, and few gold mining operations are now carried on upon the Crown lands in my division.

Gully Swamp, which at the commencement of the year was thought would have turned out a good reefing locality, has been, I may say, a failure, the results of several crushings having proved insufficient to pay expenses.

At Wood's Flat there are only one or two alluvial claims at work (in which good wages are obtained), and on the Abercrombie and Belubula Rivers a few straggling diggers, who seem to find the occupation profitable.

The claims of the Junction Gold Mining Company, on the Belubula, which have lain idle for some time past, having changed owners are about to be again worked, and I have no doubt will prove highly remunerative.

The principal gold mining operations in my division are upon Church and School lands, and I may here state that in several cases in which I have been applied to as Warden to settle disputes between claimholders, I have found myself unable to act, the present mining laws having reference only to *Crown lands*, and giving no power to Wardens to hear and determine disputes arising between persons mining on *Church and School lands*.

On these lands, at Trunkey Swamp and The Forest, a few alluvial claims are being worked with very satisfactory results to the proprietors, the sinking being to a depth of from 60 to 110 feet; and at Flyer's Creek two or three sluicing parties are I understand making as much as £5 to £6 per week per man, but the scarcity of water during the past dry season has greatly retarded their operations.

The Prince of Wales claim, at Burnt Yards, continues to turn out some very rich stone, and if it were in the hands of a Company who would work it energetically and systematically, would, I am persuaded, prove one of the richest mines in the Western Districts.

From the Brown's Creek Gold Mining Company's claim about 2,500 ozs. were obtained during the year, and but for the dry season no doubt better results would have been obtained.

At the commencement of the year there was a great rush of miners to Mandurama (part of the Coombing Estate, the property of Mr. Icely), but after a couple of months trial

the place was almost deserted, as the miners could not make wages, although traces of gold were found in all directions. At present there are only a few diggers left on this estate, who obtained a little gold at the locality known as "Golden Gully."

The amount of gold forwarded by escort from Carcoar during the year 1876 is little more than half of what was sent away in 1875, but this can be accounted for by the fact of the Junction Reefs being idle during that year, and the Brown's Creek Company not having been fully at work during that period. The actual quantity sent by escort in 1876 was 3,548 ozs., as against 6,565 ozs. in 1875.

While however the gold mining interest has seemed to languish during the past year I am glad to say copper mining has been carried on with very favourable results, and the prospects of the mines opened are highly satisfactory.

The Milburn Creek mine has been in full work, and has given employment to a large number of miners. Three furnaces have been erected, and the large quantity of ores passed through has yielded a good return.

On the Coombing Estate those enterprising gentlemen Messrs. Samuel, Lloyd, & Co. have opened out some three or four very promising lodes of copper ore. At the Coombing mine they have erected smelting works, and all their operations are carried on with vigour and success.

I have no doubt that this year will prove copper mining in the Carcoar District to be highly successful; and have great hopes that I shall be able to give a better account of our gold mining prospects in my next Annual Report.

TAMBAROORA AND TURON DISTRICT.

(Mr. Warden Sharpe, Hill End.)

As in my Report of last year, I described fully each gold-field in my district, it is scarcely necessary for me now to do more than describe the progress of mining where it is actually being carried on.

Commencing from Chambers' Creek, the long line of leases (many of which have been cancelled), extending from that place to the southern extremity of Hawkins' Hill, are entirely unoccupied; that this is the case is much to be regretted, as this locality has not been prospected, except in a very cursory and superficial manner. Many of these reefs have been proved payable, and would be worked, especially between the Turon and Macquarie Rivers if a crushing machine were within a reasonable distance. A plant has been partly erected on what is known as the Oriental Lease, at the Root Hog, about midway between Bragg's on the Lower Turon and Chambers' Creek. If this crushing machine were completed, and in the hands of an enterprising and liberal owner, I have little doubt but that work on many of these leases would be resumed.

On South Hawkins' Hill, coming towards Hill End, the first lease at work is that called Brand and Fletcher's, which has been idle for some time, but has now resumed work; next is the lease known as the Lady Belmore, which was cancelled some time since, and retaken by a party of working miners (it was formerly in the hands of a company), who have been mining some ten weeks, and lately crushed with a yield of 3 ounces to the ton. This line of reef is known as Eisenstadter's.

Next is the Royal Standard, a lease which is being worked by tributers who have every reason I am informed to be satisfied with the results of their labors. Coming north we reach the lease known as Armstrong's; this is also on tribute, the tributers have only lately commenced work; the same may be said of the Rose of England and Rapp's, which have been idle for some time past. The next lease on the main line is Carroll and Beard's, which has the deepest shaft in the district; the straight shaft in this mine has attained a depth of 500 feet, with a winze 198 feet deep, sunk from a cross-cut at about 140 feet east from the perpendicular shaft, making a total depth of 698 feet. At the present time the company to whom this celebrated lease belongs are driving north on the vein known as the Star of Peace vein, towards Krohmann's, with which mine a temporary amalgamation has been effected. The object in driving through from Carroll and Beard's to Krohmann's is to ascertain if there are any shoots

of payable stone between the two mines. This work is of great importance, as it will prove the Star of Peace vein to a depth of nearly 700 feet. Having finished the work they are at present engaged in, in the event of the vein just mentioned proving payable, the company will test their mine at a greater depth. I may mention that Krohmann's mine is also at work, irrespective of the amalgamation with Carroll and Beard's.

North and adjoining Krohmann's is Beyers and Holtermann's. The owners of this mine are at present engaged in taking out a vein at the 170 feet level—formerly left as not payable; whether it is so is as yet unknown. They are also engaged in "running stulls," that is, reworking the refuse left as worthless when rich stone was being taken from the mine. Next is the Monte Christo lease, carrying on similar work with payable results. I am informed the return was about 100 per cent. on the present outlay, and that it is the intention of the company to devote the profits now reaped to a further development of the resources of their property; the greatest depth in this mine is about 310 feet. Next we come to Rawsthorne's lease, and Brown's; these two mines are in private hands—residents of Hill End; there is no new work going on in these leases; the owners are merely engaged in running stulls and I believe with payable results.

Cock, Attwood, and Dwyer's is let on tribute, and with like results to the last.

Hickson, Creighton, and Beard's is also being worked by tributers, who are at present engaged in putting the mine in working order.

The Rampant Lion is idle, and I am informed that the mine is in a ruinous state.

Paxton's:—In this mine the greatest depth attained is 450 feet; work is now being carried on at the 400 feet level and also at the 380 feet level. At the latter depth some rich specimens were lately obtained. In this mine I am glad to note that some prospecting is being carried on towards the west in country hitherto unexplored. A belt of veins was struck 46 feet west of all formerly known veins, I believe at a depth of about 256 feet. One of these veins is more than a foot wide, and presents very favourable indications. It is intended to rise up on this vein and again cross-cut with a view of proving whether it is payable at a higher level; should it prove payable—as the same belt probably runs through the adjoining leases, their value will be much increased accordingly. The operations in Paxton's are watched with considerable interest. I may remark here that there are western cross-cuts in other mines on Hawkins' Hill at various depths, but none of them have prospected so far to the west as Paxton's—excepting the tunnels from Oakey Creek.

In the Star of Peace, which adjoins Paxton's on the north, the greatest depth attained is 620 feet, and still sinking; other work is being carried on vigorously in other parts of the mine. This lease is amalgamated with several others to the east, and employs more labour than any other mine in the district. Next the Star of Peace is Fischer and Beard's. This company is working at a depth of 330 feet, on a payable vein. The Star of Peace and its prospects are said to be very good.

East of Fischer and Beard's is Hermann's, worked on tribute. A straight shaft is being sunk in this lease to cut a large vein—the Star of Peace—worked in the adjoining lease, and which yielded, when it came to Hermann's western boundary, 4 and 5 ounces to the ton. It is expected that this vein will be cut in Hermann's lease at a depth of 348 feet, and as the shaft has already been sunk very nearly the required distance its value will soon be ascertained, although a great expense will have been incurred by the tributers before they can expect to reap any profits from their labour; still it is extremely probable that the mine will prove a very remunerative one.

North of Hermann's are the leases known as Oxon's, Mathewson's, The Crown Prince, The Morning Star, and the Speculation, all recently amalgamated under the name of the Crown Prince, and let on tribute to the Star of Peace Company, who are at the present time erecting powerful winding machinery, necessary to overcome the water, which is the great drawback to the profitable working of these mines.

East of Mathewson's and Oxon's is a lease rejoicing in the name of the Anticipated Eye-openers, which is worked by a private company who are engaged in prospecting the vein known as Rowley's rich vein.

North of the Morning Star or Crown Prince Company's ground, is the Patriarch lease, worked by a private company. In this mine, at about 400 feet, a vein, supposed to be Paxton's, has been struck; it is from 4 to 6 inches wide, and considered from present appearances as likely to prove payable. Passing Tippet's, a small lease at present idle, we come to the lease known as the Cornishman's, which is worked by a Co-operative Company of working miners; this mine is not at the present time payable, but its prospects are improving. The depth attained is about 305 feet, and still sinking.

Next is the Frenchman's lease, which is let on tribute, and may be considered payable. The vein wrought in this mine is large, the last crushing from it of 72 tons yielded I am informed, 131 ounces. Adjoining the Frenchman's is the lease known as the Cornelian, which is also worked on tribute. The vein is the same as in the Frenchman's; the last crushing from it was nearly payable, giving the tributers almost current wages, and it is improving in quality.

I now pass over the lease known as the Sons of Freedom, the Scandinavian, and others at present idle, and come to the Lombard-street lease, which was taken up for the purpose of working the Excelsior or Sergeant's Reef and others. An immense deal of work has been done in this mine; a straight shaft has been sunk 230 feet; at the 215 feet level a tunnel has been driven to the east 106 feet, and at the 200 feet level, another tunnel to the west, 265 feet. Four different veins have been cut but are not payable. At the present time the manager is sinking in a cross cut for the Excelsior vein, which in the Excelsior lease has been proved to be very rich. The great drawback in the Lombard-street mine is the water which is very troublesome; about 4,000 gallons have to be raised daily to allow of the workings being carried on. This lease has been working continuously for several years, and the proprietors certainly deserve if they do not command success. The Eureka lease comes next. This mine too has been at work for a long period, up to the month of December last, without payable results to the shareholders, which is much to be regretted. The lease however is large, and cannot be said to be yet proved.

The Excelsior is the next lease. This mine is not in such a prosperous condition as when my last report was written, but the proprietors still have faith in the value of their property.

Going north from the Excelsior we reach the Dragon, which is let on tribute. The last crushing from this mine was very satisfactory, and it may be considered a valuable property. The next mine at work is the United Reefers, now known as the Perseverance. This is a cancelled lease, retaken by a party of working miners, who have proved it payable. I am informed that this party are making rather more than double the usual rate of wages per week per man.

North of the Perseverance three block claims have been taken up on what is known as the old Union line in Golden Gully. From one of these claims a payable crushing of 16 dwts. to the ton has just been completed, and good prospects are now being obtained. Still further north is the Magnet, a lease of 4 acres, worked by a party of miners who have a large reef, easily worked, and inexpensive. The last crushing from it gave about £4 per week per man. At the present time there are 200 tons of quartz at grass.

I have now mentioned all or nearly all the mines at work in the immediate vicinity of Hill End. At the Red Hill, near Tambaroora, there are a few claims at work, and some of them are payable, but I am sorry to say that there is little doing in this neighbourhood in quartz mining.

At the Pyramul, except a little alluvial, there is no mining being carried on; and I regret to have to report that the reefs at the Crudine are abandoned, and the crushing plant removed, which was erected to work them.

Pulley's Hill or Ulmarrah, situated west of Hill End and distant from it about 8 miles by the nearest track, is one of a series of basalt hills extending for many miles down the Macquarie, on both sides of the river. This hill has been prospected by various small parties of miners for many years past, but not with payable results; perhaps because of the defective methods employed in treating the auriferous earth. Tunnels have been driven into it, in some instances to considerable distances, and shafts sunk, but not to any great depth. These workings were however all abandoned, and after a time Pulley Hill, or the greater portion of it, was leased by two separate private companies, who have erected crushing machines for treating the auriferous earth. Great expense has been incurred in the trans-

port of this machinery, as a road had to be made for a considerable distance over a country but ill adapted for the carriage of heavy materials. One of these companies has constructed a tramway from the top of the hill to the river, a distance of about 500 yards, where one of the crushing plants has been erected. It is thought that there is sufficient cement and wash-dirt or drift to keep the machinery, two crushing batteries, constantly employed, and that with economical management and improved methods for saving the gold, which is very light and fine, the venture will be a successful one. The want of machinery seems to have been the drawback with the individual miners who formerly had claims on Pulley's Hill, and whose only mode of saving the gold was by sluicing.

If the companies find the alluvial payable it is their intention to erect more extensive machinery with improved appliances for saving the gold. It is impossible at the present time to give a decided opinion as to the future of this place, as nothing but prospecting has as yet been done, and nothing but prospecting will be done for some time to come. Active operations are being carried on at the present time, and a good deal of labour employed. The success of the venture in which these two private companies are engaged is of considerable moment to this district, and it is to be hoped that they will meet with a fitting reward for the enterprise they have displayed.

Should Pulley's Hill prove payable, probably many others of a similar formation on each side of the river, among which I may mention Finch's, Bald Hill, and the Horse, Bald Hill, will receive more attention from miners than has hitherto been given to them. I am informed that small parties of miners have been working some of these cement hills for years past with very satisfactory results. If this is the case, with rough methods employed to extract the gold from the alluvial, much larger profits may be expected with improved machinery.

The Turon River Gold Field comprises Wattle Flat. The river Turon and its numerous tributaries from Sofala upwards to Jews' Creek, and downwards to its junction with the Macquarie River. At Wattle Flat, which embraces a considerable portion of this gold field, a few leases are at work, and I believe one or two of them may be considered payable.

I may here mention that the first attempt in this Colony at hydraulic mining is now being made at Circus Point, which is situated a few miles below Sofala on the Turon River.

A private English Company have taken up for gold-mining purposes a considerable area of ground at this place, and are at the present time actively engaged in taking the preliminary steps towards attaining their object. I am informed by the manager of the company that he proposes to conduct the water to be used by ditch, flume, and pipe, from a point about 7 miles above Sofala to Circus Point. The distance of line of conduits will be about 18 miles, and at their termination there will be a fall of 150 feet, which, with a little giant nozzle $2\frac{1}{2}$ inches in diameter will remove about 100 tons of earth per diem. The tail races will be constructed on a new and improved system ensuring a much greater saving of gold. The drift on Circus Point has three distinct and separate runs, varying in width from 2 to 4 chains and in depth from 12 to 30 feet, the whole of which contains gold to a certain amount. It is impossible at the present time to speak with any certainty on the prospects of the Circus Point Hydraulic Sluicing Company, but they are sufficiently satisfactory to induce a large expenditure of capital.

At the Box Ridge no work of any consequence is being carried on; some prospecting is being done but with as yet unsatisfactory results; the same may be said of the quartz ridge. The alluvial workings in this district are as in all the older gold fields somewhat exhausted, although there are still scattered along the Turon and Macquarie Rivers and up their various tributaries parties of Chinese who obtain considerable quantities of gold, and Europeans who by farming at one season of the year and mining at another, manage to make a comfortable livelihood.

At Ironbarks and Stony Creek quartz-mining seems to have improved greatly in the last six months, and the yield of gold for the past year is considerably larger than it was in 1875. The mines in this division of the Tambaroora and Turon Mining District that may be considered payable are Grimley and Reid's, a lease on the Poor Man's Reef, from which the last crushing yielded about 1 ounce per ton for 100 tons. This reef is large and easily worked.

Smith and Graham's claim at Stony Creek and that known as Fitzsimons and party: This reef varies from 8 to 11 feet wide and yields from 6 to 7 pennyweights per ton.

The Prince William : In this mine about 32 ounces were obtained by four men in five weeks, but as the greater part of this gold was obtained by breaking up rich specimens the average per ton cannot be arrived at.

In the Perseverance Reef, which is let on tribute, the tributers are raising good stone, variously estimated at from 2 to 5 ounces. It is I am informed intended to remove the crushing plant at Stony Creek. This will be a great hindrance to the development of the reefs in this locality.

In conclusion I believe I may venture to assert that mining in this district is in a more prosperous condition than it was when my last report was written ; and as a plain proof of this I would draw attention to the annexed schedule, showing the quantity of gold (as nearly as can be ascertained) won in the Tambaroora and Turon Mining District during the year 1876, from which it appears that there is an increase of 2,229 ounces 13 pennyweights and 13 grains over the returns for 1875.

In the Hill End division there is an increase of 245 ounces 12 pennyweights and 4 grains.

In the Sofala a decrease of 957 ounces 2 pennyweights and 11 grains which may be accounted for by the fact that almost all the gold obtained in this division is alluvial ; in the other divisions the chief yield is from quartz. At Sofala too it is very difficult, if not impossible, to get a correct estimate of the gold won during the past year, because most of it is obtained by the Chinese, who dispose of it in various ways ; and I am informed that a considerable portion of it is sent to Bathurst instead of Sofala for transit.

In the Ironbarks division the increase amounts to 2,940 ounces 6 pennyweights and 20 grains.

Another sign of improvement is that there are at the present time a considerable number of mines on Hawkins' Hill, from the Lady Belmore on the south to the Cornelian on the north, that may be said to be in a prosperous condition and to be daily improving, and this change has taken place only lately. I may here remark that there are at the present time only about six mines on Hawkins' Hill worked by public companies, and of these about two are paying expenses and one may be considered to be in a fairly prosperous condition. Most of the other mines formerly in the hands of public companies are now let on tribute, and the change seems to be for the better as most of them are paying handsomely. It must, however, be observed that in a good many instances the tributers are not doing any new work—not prospecting—they are merely engaged in what is called in mining phraseology “running stulls.” That is, as I have already explained, reworking the refuse left as worthless when rich stone was being taken from the mines. This employment cannot last more than a year or two at the longest, and then prospecting must be gone on with or the mine abandoned. As the tributers are mostly working miners it is probable the money will be expended in the same way as it was won, that is in gold mining.

The great drawback to this division of the Tambaroora and Turon Mining District is that we are entirely dependent on the mining industry for support, and consequently the fluctuations in our prosperity are more apparent than in places where there is a large extent of agricultural country in the neighbourhood on which the working miner can fall back when his finances fail and earn sufficient to allow of his resuming mining pursuits at no distant period.

In the Sofala and Ironbarks divisions of this district and in a small portion of the Hill End, many of the miners are small farmers, and make a comfortable livelihood for themselves and families by farming and digging according as the season is favourable to the one pursuit or the other.

I may be allowed before concluding to make a few remarks with reference to the most important part of my district—Hawkins' Hill. I believe it will be admitted by all who take an interest in the Hawkins' Hill mines that the greatest drawback to their development is the small size of the leases held by each separate company. All the rich veins underlying to the east in the proportion of about a foot in two, the consequence is that these veins leave what are known as the rich claims at a depth of from 5 to 600 feet. This of course is known to the holders of them, and therefore they are not seeking (with one exception) for a second shoot of gold at a depth over 700 feet, as by so doing they would only be expending money for the

benefit of those parties who hold the leases into which these easterly veins in all probability underlie. It seems to me that this oversight could have been remedied (as has been done by the Star of Peace Company, who have taken up the adjoining ground to the east). For instance, if Carroll and Beard's, Krohmann's, and Beyer's and Holterman's leases were amalgamated with the Great Extended lease and the Golden Crown, which are on their eastern boundary, the winding machinery belonging to the first-mentioned of these mines is of sufficient power and is so substantially erected that the mine could be worked thoroughly to a great depth. The same course could be adopted in other mines. It has frequently been predicted that, were the whole of the Hawkins' Hill mines, from Matthewson's on the north to Rapp's on the south, amalgamated with all the leases on their eastern boundary and reformed into three or four separate companies, it would ere long regain its lost prestige and rise to its former prosperity. I will venture to assert that until such amalgamation takes place or some new payable veins are discovered in the western cross-cuts of Paxton's and other mines, no marked improvement will appear in the quantity of gold produced from Hawkins' Hill.

I may here observe that many of the leases lately cancelled in this locality are now retaken with a view of properly working them and not with the intention of selling or "floating." The tribute system, as I have before remarked, has been adopted in many of the mines on Hawkins' Hill, and I believe is found to work satisfactorily. The great danger under this system is that the tributers in their anxiety to make the mine which they hold on tribute profitable as quickly and cheaply as possible, will not pay sufficient attention to the working and timbering of it, and in consequence of this neglect the mine is seriously and perhaps permanently damaged as regards its future development. This, however, cannot occur on Hawkins' Hill as the miners are under the supervision of an able and experienced officer lately appointed. I refer to the Mining Inspector.

There is no mining being carried on at the present time in this district for minerals other than gold, but a considerable amount of work has been done on a lease at what is called "Razorback," on the Upper Turon, near Palmer's Oakey, from which a considerable quantity of antimony has been raised. I regret to have to state that this lease is at present idle in consequence of litigation between the parties interested in it. At the Crudine, a few miles from Sofala, a lease of 40 acres has lately been taken up for the same mineral; some large blocks of almost pure antimony were found and a considerable amount of prospecting has been done, but as yet without finding the lode.

RETURN showing the yield of Gold in the Tambaroora and Turon Mining District, for the year ending the 31st December, 1876.

Division.	For the Quarter ending	Quantity.	For the Quarter ending	Quantity.	Total.
		ozs. dwts. grs.		ozs. dwts. grs.	
Hill End ...	31 March, 1876	Alluvial	31 March, 1876	Quartz...	
" ..	30 June, 1876	"	30 June, 1876	"	
" ...	30 Sept., 1876	"	30 Sept., 1876	"	
" ...	31 Dec., 1876	"	31 Dec., 1876	"	
		3,191 12 4		15,055 5 9	
Sofala	31 March, 1876	"	In Bankers' hands, 31 Dec.	1,229 0 7	
"	30 June, 1876	"			
"	30 Sept., 1876	"		16,284 5 16	19,475 17 20
"	31 Dec., 1876	"			
		7,053 7 17			7,053 7 17
Ironbarks...	31 March, 1876	} Quartz and Alluvial.		887 13 1	
" ..	30 June, 1876			1,987 13 3	
" ...	30 Sept., 1876			1,842 15 17	
" ...	31 Dec., 1876			1,752 6 8	
				6,470 8 5	6,470 8 5
					32,999 13 18
					Value, at £3 17s. 6d. 7/8 oz., £127,873 15s. 9 1/2 d.

MUDGEES DISTRICT.

(Mr. Warden Browne, P.M., Gulgong.)

IN my Annual Report, which I have now the honor to furnish for the information of the Minister for Mines, I regret that I am unable to point to any marked or successful development of mining enterprise in the Mudgee District. On the contrary, a manifest decadence has taken place, both as to the yield of gold and the number of resident miners. In the neighbourhood of Gulgong, still the most considerable mining centre, but 749 miners' rights have been taken out during the past year as against 1,721 in 1875, while the gold sent down by escort from the same locality has not exceeded 18,446 ozs. 5 dwts. 17 grs. as against 24,799 ozs. 4 dwts. 18 grs. in 1875. These facts in the judgment of many point to the belief that the alluvial deposits in the district generally have been nearly if not completely exhausted.

Against this opinion the occasional discovery of rich deposits even in localities held to be thoroughly prospected seems to militate. In the Magpie Gully, less than 5 miles south of Gulgong, a place daily traversed and examined for years, claims are now at work with as good results as perhaps ever obtained at Gulgong. I am informed that one party washed 280 loads of wash-dirt last week, yielding half an ounce to the load, while an adjoining claim has 300 loads awaiting the machine, estimated at an ounce or more. The sinking is but 20 feet. The alluvial sinking in the valley of the Canadian and its tributary, Nil Desperandum, has always been amongst the most permanent and remunerative of the many minor gold fields surrounding Gulgong. It yet lays claim to the same character. In the oldest claim of the neighbourhood the prospectors of the Canadian lead, a nugget of 64 ozs. weight was found in November last. The unusual depth of wash-dirt in this lead in several instances

exceeding 40 feet, has led to an opinion that a second bottom will be eventually found. But the extraordinary depth of auriferous drift would appear to have been caused by "crevasses," or fissures in the limestone which forms the present bed rock, into which, by aqueous or other action, the auriferous drift has been caused to pour. The whole of these immense aggregations of wash-dirt are found to be uniformly pervaded by the precious metal. Near and beneath the immense limestone boulders which the miner is unable to raise to the surface have been found the enormous fossil bone-fragments of a gigantic marsupial.

At Home Rule and Cooyal it seems to be conceded that nothing can be done without the aid of powerful pumping gear, worked by steam machinery, so persistent and extensive is the body of water encountered after a certain depth. The shaft of the David Buchanan lead, at 200 feet, has been long abandoned to the encroaching water, although extraordinary efforts were made for a while to keep it under, and an amount of local capital expended, incredible to those who have not observed the miners' extraordinary tenacity of purpose when he scents gold.

It is still believed that a subsidy from any fund provided by Government for the purpose of aiding legitimate prospecting might here be expended with a strong probability of public advantage.

The singularly rich and inexpensively worked gold field known as Lowe's paddock, upon the private property of Charles Lowe, Esq., of Gooree, is distant from Home Rule about a mile and a-half in a southerly direction. A party of experienced miners are now testing an opinion that a continuation of the lead, Rose of Australia and Rose of England, once showing twenty red flags in a row (the gold ensign), may yet be struck on the eastern bank of Cooyal Creek. Water is the great obstacle to mining enterprise here. Another promising gold field in this locality is situated upon the property of William Henry Lowe, Esq., of Eururderee, an estate lying between Home Rule and the town of Mudgee. It is popularly known as "The Log Paddock," and contains a well defined lead upon which the half dozen "upper numbers" are on good gold. In the progressive onward direction of this lead the great enemy water again becomes powerful. Without co-operative capital and machinery it is not thought that the claim so situated can be profitably worked. There is a probability of the Log Paddock lead being traced into Crown land, a circumstance which would lead to a large accession to our present population. I mention this mining locality, which perhaps strictly speaking does not come within my province as Warden, principally to convey an idea of the highly auriferous description of the locality generally.

The Moonlight, Caledonian, Fraser's, Perseverance, and other leads once yielding fairly are abandoned for the most part. They have been observed to trend in a westerly direction towards the valley of the Cudgong. Arguing from the geological data that the overlying basaltic mass, in some instances more than a hundred feet in depth, has bifurcated near the Cudgong River, which it crosses at no great distance from proved payable ground, it seems probable that prospecting may yet be richly rewarded in this subdivision.

Between Adams's Lead, the oldest and not the worst paying of the early discoveries at Gulgong, and the Black Lead, lies a large tract of hitherto gold-barren country. A greenstone dyke has been lately discovered to traverse it, running in a westerly direction from the Red Hill. It is rare that the decline from such a formation is found to be without gold, and several reasonable finds have lately been secured at no great distance, between Adams's Lead and a prospecting claim in deep ground, known as the Star of the West. This claim has been again taken up for the purpose of testing the slope towards the Moonlight Lead. At Tallawang, lying 7 miles west of Gulgong, a small amount of re-working, the abandoned alluvial still proceeds. The cement deposits which were once believed to be likely to provide employment for large numbers of miners are at present unworked.

With respect to quartz reefs I have much pleasure in stating that the Welcome mine, at Three-mile, the most promising quartz reef ever worked in the vicinity of Gulgong proper, is about to receive a fair trial. In view of reducing the very considerable cost and inconvenience occasioned by the carting of the stone to a distance for the purpose of crushing, the shareholders have arranged for the erection of a battery of fifteen head of stampers at the claim. Water is here secured by a dam across the valley of the Three-mile, and in despite

of the present untoward season, a sufficient supply has been stored with which to treat the 500 tons of stone already at grass. A contract for 1,000 tons of stone has been taken, and the raising is being proceeded with. The reef, which is 7 feet in width, has been lately struck at 170 feet in depth and is being worked by a winze towards the 80 feet level. The first crushing will commence on the 12th instant, and its satisfactory result or otherwise will doubtless affect quartz mining on this gold field to a marked extent.

In the localities of Hargraves and Merinda the reefs are at present chiefly unworked. In the former gold field an attempt to work a reef, long disused on account of water, has resulted unsuccessfully. The gold fields of Upper Meroo, Windeyer, Avisford, Clarke's, and Campbell's Creek are exceptionally dull. The branch of mining almost exclusively pursued in these neighbourhoods—the sluicing of formerly worked areas—necessitating an abundant supply of water, the present drought has caused an almost total collapse. A few miners still adhere to the river claims, but much temporary desertion has taken place. The large sluicing companies at Merinda, whose dams and races have absorbed the expenditure of a large amount of capital, share the general inconvenience and depression. At Mitchell's Creek, near Lincoln, situated about 12 miles from Wellington, the extensive lode of gold and copper mingled known as Fitté's mine, has been at work with paying results for several months. An alteration of plates in the very extensive crushing plant has caused a temporary suspension of work, which will, I am informed, be shortly resumed. The quartz reef known as the Mitchell's Creek Company's mine has been steadily worked during the year under the tribute system. It is understood to pay a high per-centage, and a liberal rate for crushing to the proprietors, as also to remunerate the co-operative workmen.

The alluvial field, formerly known as Jawbone, is still worked by a few miners. The gold from these localities is transmitted to Wellington, from which town a special escort was provided at my recommendation some months since for the very much increased monthly yield. In the close vicinity of Lincoln some very promising quartz reefs have lately been discovered, and I look to it as the most promising locality at present known in the district.

Without laying myself open to the charge of over sanguine expectation, I do not fear to state my opinion that the day of mining prosperity for the Mudgee division of the Western Gold Fields has by no means passed away for ever. A variety of concurrent causes have doubtless produced a certain deficiency of yield—a temporary stagnation in mining enterprise, but looking to the profuse and distinct indications of mineral wealth scattered over an area of not less than a thousand square miles, it cannot be within a score of years to come that any dogmatic assertion of the exhaustive prospecting of this vast region, as having taken place, shall receive consideration. A generation, as has been proved in the neighbouring Colony of Victoria, is a short period in the history of a gold-field, and though both time and capital may be needed for the full development of the mining wealth of the district, the long delayed hour of success must eventually arrive. To associated enterprise, fed by unsparing capital, and aided by the most powerful and complete modern machinery, the future of the great gold-field of the Mudgee district will doubtless be confided.

The most experienced miners (the men of practice), the most deeply read geologists (the men of theory), are of one accord in a conviction, that in the neighbourhoods of Gulgong, Home Rule, and Tallawang no sinking has reached sufficient depth adequately to test their true richness.

In these particular localities, which have produced in six years gold to the amount of a million and a half sterling, there are known to be a dozen leads and deposits, some obviously at the intersection of the ancient long-buried watercourse which have never been adequately prospected—fully and demonstrably tested according to mining law and experience. If in a future season of abundant capital and far-seeing enterprise attention be directed to our disused shafts and drives, it may be that some one of the present dwellers in or around Gulgong may behold the realization of an oft-repeated prophecy.

Looking to the magnificent results of perseverance in the Colony of Victoria, on gold-fields long asserted to be worked out and exhausted, it seems not too much to contend that with a sustained search for reefs, and the lower deposits of alluvial, at depths double and treble those reached on any gold-field in the Mudgee district, a new era of prosperity may be inaugurated, sufficiently solid to recoup lost fortune, if not lost years, to the mining community.

LACHLAN DISTRICT.

(Mr. Warden Dalton, P.M., Forbes.)

THE absence of rain in the northern portion of the Lachlan Mining District during the past year, has restricted gold mining to such parts of the old workings as were known to be payable, and even there continuous work was impracticable, as water was rarely available for mining purposes, that supplied at long intervals by passing thunder showers being speedily evaporated by scorching westerly winds. Day after day clouds drifting from the seaboard that promised rain were absorbed by the parched atmosphere of the waterless interior, and ceased even by their shade to moderate the solar heat. The baked and heated earth yielded no particle of moisture, and dust storms and whirlwinds usurped the place of showers.

As a proof of the obstruction to gold mining caused by a want of water, I may cite the case of a party working the richest alluvial claim in the district on the Wapping Butcher lead. They have been unable to wash up since April last, although they have never ceased to raise auriferous drift, and have now about 1,500 loads on the surface. This mine has averaged about 5 ounces of gold to the cubic yard of wash.

For nearly two years, with the exception of the Lachlan river and its small tributaries in the south-eastern corner, there have been no running streams in the district.

Prospecting has been impossible, and however rich in gold and other metals certain parts of the dry country may be, it is not surprising that no important advance has been made in the development of its mineral wealth, that mining energy has been paralysed, and that as regards the discovery of auriferous leads or mines we occupy nearly the same position that we did at the commencement of the year.

As compared with the years 1874 and 1875 the quantity of gold won during 1876 bears a fair proportion to the number of mining tenements worked, of men employed, and the quantity of vein stuff or wash drift treated.

The mining operations of 1876 having been thus restricted to ground described in former reports, I will confine myself to such matters as may possess a special interest, leaving details and statistics to the Mining Registrars in their respective divisions.

In April last a report was made of the discovery of gold in what was thought to be payable quantities, about 100 miles to the north-west of Forbes, in the dry belt of country that extends east and west midway between the Bogan and the Lachlan Rivers. Upon inspection I found that cassiterite or stream tin, auriferous quartz reefs, copper ores, both black, blue, green, and grey, magnetic iron, brown hæmetite, and other metallic ores, were abundantly interspersed over large areas of generally waterless country. Subsequent to the date of my report on this district several parties have prosecuted their researches for about 60 miles further west, and they report having found gold, copper, and iron to the extreme limit of their explorations, but neither water nor watercourses that indicated a sufficient supply at any season of the year for mining operations. Amongst other discoveries was an auriferous quartz reef at Jumble Plains. A sample from this reef, when tested at the Mint, yielded at the rate of 4 ounces of gold per ton, although no gold was visible in the stone even by the aid of a lens. There was also a rich lode of copper ore found near Bona West; it is now under application for lease, and in its vicinity are large fields of rich iron ore. Other parties prospecting for stream-tin recently report having found it in payable quantities in several localities, both east and west of the site of the original discovery, but in no place in the vicinity of running water.

A narrow belt of cuperiferous country has been traced from Gobandry East to the north of Parkes, and a lode worked at the eastern extremity. A few tons of the ore have been smelted at Bathurst; the result was satisfactory. Gold has also been obtained near Hervey's Range.

Bald Hills, about 6 miles north of Forbes, is a strip of high land descending gradually to a belt of gilgi country that stretches to the eastward winding towards the river. Upon this high strip a lead 180 feet in depth was discovered about two years since, worked without profit, and abandoned in 1875. In August last, Nos. 1, 2, 3, were reoccupied by Matheson and party as an extended claim, the members of this party having held various interests on the lead from its first opening. It is thought that they are on the head of a lead

that will be found trending towards the deeper channel indicated by the chain of gullies. A description of this claim will hold good for the locality. The sinking is through clay derived from the decomposition of schists and trap rocks with large boulders in the depth; these are interlaced with veins of quartz and calcite, and the formation is identical with the rocks that crop through the surface of the Bald Hills, a mile distant; immediately over the wash and mingled with it, are boulders of quartz and igneous rocks, much rolled and waterworn, evidently the remnant of a pleiocene drift. The wash is a decomposed breccia, clay, and quartz gravel; the western bank of the channel is well defined; the eastern has not been reached, and is marked by the running out of the wash which is from 12 to 30 inches in thickness, and from 15 feet to 50 feet in width. The ground is wet, making about 1,800 gallons of water in 24 hours. The bottom is soft and swelling, with patches of decomposed slate and sandstone. When this lead was first worked it was found to be patchy, four bags of wash giving 2 ounces of gold, but the general return ranged from 5 to 12 dwts. per load.

The first occupants possessed neither whims nor adequate machinery for working deep and wet ground, and the water was constantly ruining their shafts and drives. The present holders of the ground have erected a puddling machine within 12 feet of their shaft; this they supply with water raised from the mine; they are about to erect a whim when it is probable that from 8 to 10 dwts. of gold per load will prove payable. This party have already raised and washed 100 loads; the result was 70 ounces. The value of the gold is £3 10s. 6d. per ounce. Three other parties have taken up claims on this lead, but have not yet done any work thereon. I anticipate that this lead will sooner or later prove of value as its course is traced.

The Lachlan Gold Fields: With the exception of that near the Bald Hills there has been no gold-mining during the past year within this division that deserves more than a passing notice. Three parties have been profitably employed during several months in extracting gold from sludge, and a fourth party at intervals has been in search of a payable reef within their leased tract. Rayner and party have been prospecting the Madman's Lead, and obtained therefrom a patch of rich specimens of gold in quartz; a portion of these were transmitted as a loan by W. T. Coonan, Esq., for exhibition in the museum of the department. Similar patches of auriferous stone have been frequently discovered amidst the small veins that intersect the altered and fractured stratified rocks upon this gold-field, but as yet they have not led to any permanently payable reef. Robert Callow has crushed several tons of surface waste from which he obtained a small quantity of gold, but not sufficient to induce him to continue the operation; and Phillip Davis, late manager of the Dayspring Company, with three others, have applied for leases of two tracts of auriferous ground on the south lead; upon these work has not been commenced, but it is generally believed by those who best know the locality, that it will prove a safe investment.

Since the "Mining Act of 1874" came into operation it has become a common practice for unauthorized persons to enclose areas of from 2 to 10 acres of land within portions of gold fields reserved from sale or conditional purchase, in some instances for the purpose of residence, in others for cultivation; but in most cases for purely speculative purposes. The result is that the miners are often restricted to the old lines of exhausted workings, and the gold mining interest thus hampered is seriously prejudiced. Frequently persons who make enclosures by virtue of which they set up a claim to the land so enclosed, appear to me to be the mere agents of others who have arranged some means whereby they will ultimately obtain possession of the land, as I have observed cases where from 4 to 8 acres of land, valuable as regards situation and quality, have been surrounded by an expensive fence of such a description as to be quite beyond the means of the ostensible occupant. These trespassers upon the gold fields, who knowingly set the law at defiance, are sometimes wealthy men holding responsible positions in neighbouring towns, who by their example mislead the ignorant portion of the community. It is urged that the Warden of the district under the Mining Act is simply a judicial officer—that every case in the Warden's Court must be commenced by summons—that that officer cannot order proceedings to be initiated and adjudicate in the same case—and that private persons will not incur the odium of prosecuting

on behalf of the Government. Clause 123 of the Mining Act provides "that any person who shall occupy for the purpose of residence a greater extent of land than he is entitled to occupy, shall forfeit and pay for every such offence £10," but makes no provision for his removal. Many of the enclosed portions referred to are of such value that the occupants would not hesitate to pay the penalty; and then it is questionable whether they could be prosecuted a second time for the same offence; and further, he who uses land for a cultivation paddock or an orchard may not use it for the purpose of residence. Under all the circumstances I think that such trespassers should be removed, under the provisions of the 32nd clause of the "Crown Lands Occupation Act of 1861", upon the information of some person duly authorized by the Honorable the Minister for Lands. If the provisions of the 2nd clause of the Lands Acts Amendment Act are stringently administered the evil complained of will soon die out. The applicants for permission to purchase by virtue of improvements must be in authorized occupation at the date of their application; and Form A (application for the purchase of improved Crown lands) requires the applicant to state the authority under which the land is used; this should not be evaded, and should be made a primary condition of the application being received and further dealt with. Perhaps if such applications passed through the Mining Department before they were entertained by the Department of Lands it would tend to simplify transactions that are frequently of a complex nature, particularly in the vicinity of rising towns.

The Billabong Gold Field, notwithstanding that it has shared the universal depression of the mining interest, and the reduction of its population, still maintains its position as the most productive gold field in the Colony, although others may have attracted a larger share of attention. For the reasons stated, mining operations have been limited during the past year to such parts of the old leads and workings as were in the vicinity of temporary collections of storm water. The Wapping Butcher, the London, the Ben Nevis, the lower part of M'Guiggan's, and the Welcome Lead, with Sardine and Tear-away Gullies have been the chief scenes of mining for alluvial gold; on all the other leads a few claims have been occupied by fossickers or gleaners, who shift about as their inclination or hope leads them amongst the abandoned claims. There have been no rushes worthy of note, with the exception of one about September last, to the Scrubby Plain, where gold was obtained but not in payable quantity. On the Wapping Butcher Lead Jones and party have now about 1,500 loads of wash on the surface; this is expected to yield 3 ounces of gold per load, and is awaiting a rainfall. The party are now raising the base of a conglomerate that they anticipate will yield gold in nearly the same proportion. This conglomerate in an adjoining claim gave a return of about 2½ ounces of gold per ton. Four or five other claims upon this lead have also been worked with profitable results at intervals during the year.

On the London Lead twelve claims have been worked during the year. Of these, No. 19 washed 1,830 loads for an average of 9 dwts. 12 grs. per load, some of the drift yielding an ounce, other portions 5 dwts. No. 17 put about 1,200 loads through the puddling machine, the lowest return being 8 dwts., the highest 14 dwts. per load. The other ten claims were not mined upon continuously, and have in the aggregate washed about 5,500 loads, which produced on an average 5 dwts. per load. The bottom on this lead is shale and sandstone in benches, with bands and blocks of brown hæmatite; the depth is from 36 to 75 feet. No. 23 is 175 feet to 200 feet deep between limestone walls; the wash here contains from 2½ to 3 dwts. of gold, and is of an undetermined thickness. This deep channel crosses the Ben Nevis Lead half a mile to the westward, where at a depth of 200 feet through a decomposed sandstone a few Brancopeds have been found on a crystalline argillaceous limestone.

Ben Nevis Lead: From four to six parties have been working on this lead during the year. The depth is 112 feet, and the yield of gold from 3 to 6 dwts. per load. On this and the preceding lead no new ground has been opened.

The Sardine and the Tear-away Gullies have each afforded employment to a few parties; upon the latter a nugget weighing 22 ounces was obtained. The average yield was 6 dwts. per load.

Upon M'Guiggan's Lead south a few claims near the Billabong Creek continue to be worked, No. 9 with profit, and Nos. 10, 12, 14 yielding a return barely remunerative.

Each of the other alluvial leads is here and there occupied by fossickers, who are and have been struggling for a subsistence.

A large number of the gold miners who occupied this gold field in 1875 are now employed in the western interior tank-sinking, and the discovery of a lead would cause them all to return.

Quartz and gold in the matrix.

Amongst the discoveries of 1876 may be recorded the fact that the rock upon which the auriferous drift of the Bushman's Lead reposed at a depth of 90 feet below the surface is a mass of arenaceous schist, much disturbed, altered, fractured, and dislocated by an intrusive greenstone or diorite. Long dykes of the latter may be traced under the original alluvial workings much of the bed rock being decomposed and intersected by a network of rubbly quartz reefs and veins of that formation, and also of calcite. Many of the smaller veins are auriferous in patches along the course of the decomposed greenstone dykes. The alluvial claims in this locality were very productive, but always irregular in their yield, the best being but a succession of rich patches. The old workings are blocked with the debris of large quartz reefs, as a rule barren, and these accumulations conceal the gold-bearing rocks upon which they have been collected. The gold won from the alluvial drift that rested upon the sandstone and diorite was worth £3 14s. 6d. per ounce, while that now obtained from intrusive dykes and small veins intersecting the rock subjacent to the drift, is worth only £3 5s. per ounce.

The following are a few of the claims that have been re-occupied during the past year for the purpose of quartz-mining:—

The Bonnie Dundee, Thomas Mitchell and party, 270 by 230 feet: This claim is intersected by a partially decomposed greenstone dyke interlaced with small veins of auriferous quartz and calcite; there are also large blocks of quartz containing little or no gold; the whole is in a rubbly state. The veins have a general direction from the eastward at an angle of 45°, and are cut off by the western wall, a hard arenaceous rock, well-defined; the eastern wall, if any exists, has not been discovered.

The 1st crushing of 8 tons from a depth of 90 feet, or the bottom of the original works, yielded 4 oz. 10 dwts. per ton.

The 2nd crushing of 72 tons yielded 23 dwts. per ton.

The 3rd crushing of 200 tons yielded 10 dwts. per ton.

The 4th crushing of 700 tons, taking everything in the dyke for a width of 40 feet. 6 dwts. per ton; depth of the workings below the alluvial drift, formerly worked, 14 feet; from surface, 104.

No. 1 South: Blair, Stewart, and party encountered less hard bars, and found a more regular decomposition. Yield, 13 dwts. per ton.

No. 2. Herbert Ehlers and Co.: Here the dyke was harder. Yield, 10 dwts. per ton.

Lowling and party, leaseholders, from the same dyke, have obtained some very rich specimens of gold in quartz; not yet crushed.

Heber and party crushed 170 tons from what is supposed to be the Bonnie Dundee dyke. Yield, 11 dwts. of gold per ton; decomposition in patches.

On 'Possum Gully, a branch of the Bushman's, opposite to the Bonnie Dundee, and having its source under the Caledonian Hill, is the claim of Tattersall and party. The reef is a rubble quartz, 18 inches wide, within walls of decomposed trap rock. From this holding the 1st crushing of 100 tons yielded 1 oz. 11 dwts. per ton; 2nd crushing, 8½ dwts. per ton; 3rd crushing, 1 oz. 9 dwts. per ton; 4th crushing, 8 dwts. 12 grs. per ton.

O'Brien and party, on the same reef, westward of Tattersall's: 1st crushing, 170 tons; yield, 7 dwts. per ton. 2nd crushing, quantity unknown; yield, 10 dwts. per ton.

Victoria Reef, westward of the Frenchman's Gully, Sneedan and party of six miners: This reef is from 3 to 5 feet wide, and the party can raise about 90 tons of quartz weekly. 1st crushing, 160 tons; yield, 12 dwts. 12 grs. per ton. 2nd crushing, 180 tons; yield, 6 dwts. per ton.

In the vicinity of the Victoria Reef there are numerous quartz reefs known to contain gold that have not been yet mined upon; there are also several half-worked leads at the base of the ranges, but no water available for extensive mining operations. To these may be added

a portion of M'Guiggan's Lead north, that will be profitably reworked when water becomes more plentiful in the locality, so as to reduce the cost of cartage and puddling. Payable quartz reefs may be reasonably sought for at the heads of Richardson's and the Tear-away Gullies, and also at the head of M'Guiggan's Lead, and along the line of the old alluvial leads, as wherever they proved to be rich in coarse gold, but little water-worn, a reef or lode cannot be far distant.

Evanawich and party are still proving their reef, and occasionally obtain some rich specimens, but have not yet tested the stone at a crushing machine.

The Dayspring and the Pioneer Reefs at Currajong have been re-occupied by small parties.

There is some prospect of the Bushman's Reef being again worked; the yield was never less than 18 dwts. per ton, but the narrowness of the vein, and the hardness of the investing rock, made the cost of raising the stone so great as to leave no margin of profit for the shareholders hitherto.

It will be observed that dykes, lodes, reefs, and veins upon this gold field become less auriferous and narrower as they pass into formations that have not been subjected to decomposing influences; however, the question has never been fairly grappled with, as one or two unfavourable crushings are sufficient to cause the abandonment of a claim.

That portion of the gold field on the east side of Goobang Creek, reserved from conditional purchase in March last, has been occupied by conditional purchasers. There has been no mining upon that portion of the gold field during the past year; and no effort has been made to trace the further extension of the Great Northern and Bushman's Leads beyond the point where they were lost.

The want of permanent water and moisture in the atmosphere is one of the chief obstacles to the rapid advancement of this district and the development of its immense resources. By the construction of a dam or embankment across a part of Goobang Creek, where the stream has cut a channel through a ridge, a lake would be formed, and the water thrown back several miles. This dam could be erected at the same cost as the bridge (£800 to £500) which it is proposed to build on the same site, being on the line to Orange, and one mile and a quarter from Parkes. The top of the dam would form a causeway, and thus render a bridge unnecessary.

The Goobang or Billabong is not a permanent stream, but one flood during a wet season would fill the proposed reservoir, and secure a twelve months' supply of water.

Minerals other than Gold.

33 tons 10 cwt. of grey ore of copper have been raised by Willacy and party near the Secret Reef, 6 miles north of Parkes, and of this 3 tons 10 cwt. were sent to the smelting works at Bowenfels by way of an experiment to test the value of the ore. The returns were 29·75 per cent. of pure copper, for which after deducting all expenses, including that of carriage, the shareholders received £28. The mine is not worked at present.

Mr. Licensed-surveyor Phillips has reported to me his discovery of a pure saccharine marble, suitable for statuary, about 4 miles north of Parkes, and of other marbles of commercial value, some beautifully marked and coloured. A vein of kerosene shale of the best quality has also been recently reported; it is situated about 13 miles N.E. from Parkes, and is stated to be 7 feet wide, and to crop out at several places in the same belt of country.

There is a plethora of mineral wealth in this district that will not be developed until the population can be counted by millions. As it is, men wandering through the interminable wilds of the western interior are constantly making discoveries of great value which they are unable to turn to any profitable account, and of which they most frequently leave no record.

At no time during the year 1876 was there more than 800 gold-miners employed upon the Billabong Gold Fields, and during the last four months the number did not exceed 600; this embraces both the Parkes and M'Guiggan's divisions. The population during the same period fluctuated between 4,500 and 3,500, including about 660 children under fourteen years of age, and the residents in the town of Parkes and the village of Tichborne.

The branch Banks at the Tichborne were closed in July last.

The quantity of gold won upon both divisions of the field was in the aggregate as follows:—

	ozs.	dwt.	grs.
Transmitted by escort from Parkes and Tichborne to the Mint	23,057	5	5
In the hands of the Banks at Parkes, 7th January, 1877, the produce of 1876	548	17	7
In the hands of private persons, 1st January, 1877—the produce of 1876	500	0	0
Total produce of 1876	24,106	2	12
Transmitted by escort from Forbes, produce of 1876	476	13	22

There are on the Billabong Gold Field about 4,500 ounces of gold in the drift awaiting rain, that the year 1876 may fairly lay claim to, as it was raised during that period.

Cudgellico Lake Gold Field.

The only gold-mining upon this field is carried on by the Foster's Reef Gold-mining Company who have recently recommenced operations with improved appliances for drainage and with every prospect of success, as the mine is now under the control of an able manager. The country is much fractured and faulted, and the chief difficulty will be in finding the detached blocks of reef.

Emu Creek and Tyagong Gold Fields.

During my visit to the Emu Creek Gold Field, in April last, knowing that the working shaft, situated upon the quartz workings held by the Grenfell Consols Company, on O'Brien's Hill, had been sunk to a greater depth than any other in the Colony, I caused it to be examined by the manager, who obtained samples of the rocks intersected by the fissure, and forming the walls of the reef, at the following depths:—10 feet, 150 feet, 250 feet, 400 feet, 550 feet, and 700 feet on the underlay, numbered respectively 1, 2, 3, 4, 5, and 6. These were packed by me, and left at Grenfell for transmission to the department. No. 2 appears to have been taken from an altered schistose rock. It is not unusual in this district to find blocks of altered slate enveloped in granite, some of considerable size.

I enclose a rough plan of a section of the shaft, prepared from information supplied by Mr. Manager Veal and my own observation and previous knowledge of the ground, which dates from its first marking, in 1866, as a prospecting claim.

It will be observed that, so far as the quartz vein was enclosed by the brown granites, it proved to be highly auriferous, and that, on entering the blue or grey granites at a depth of about 370 feet, its value rapidly decreased, until gold at 530 feet finally disappeared. It may also be noticed that near the junction of the brown and blue granites a slide or fault has occurred, and that to a depth of 70 feet the quartz contained within the fissure is fractured and rubbly, and the walls rough and irregular,—all denoting much disturbance at that level (370 feet to 440 feet); in fact at a greater depth the reef has not yet proved to be remunerative.

The fissure appears to have extended through granites of different ages.

The numerous quartz reefs intersecting the same granitic belt have been payable to a similar depth, and under similar conditions. The Homeward Bound has been sunk to a depth of 475 feet, the Lucknow 385 feet, and the Welcome 250 feet; these reefs have all produced much gold, the sinking on the two former having been continued to their present depth by companies without profitable results, the original holders not having worked below 300 feet.

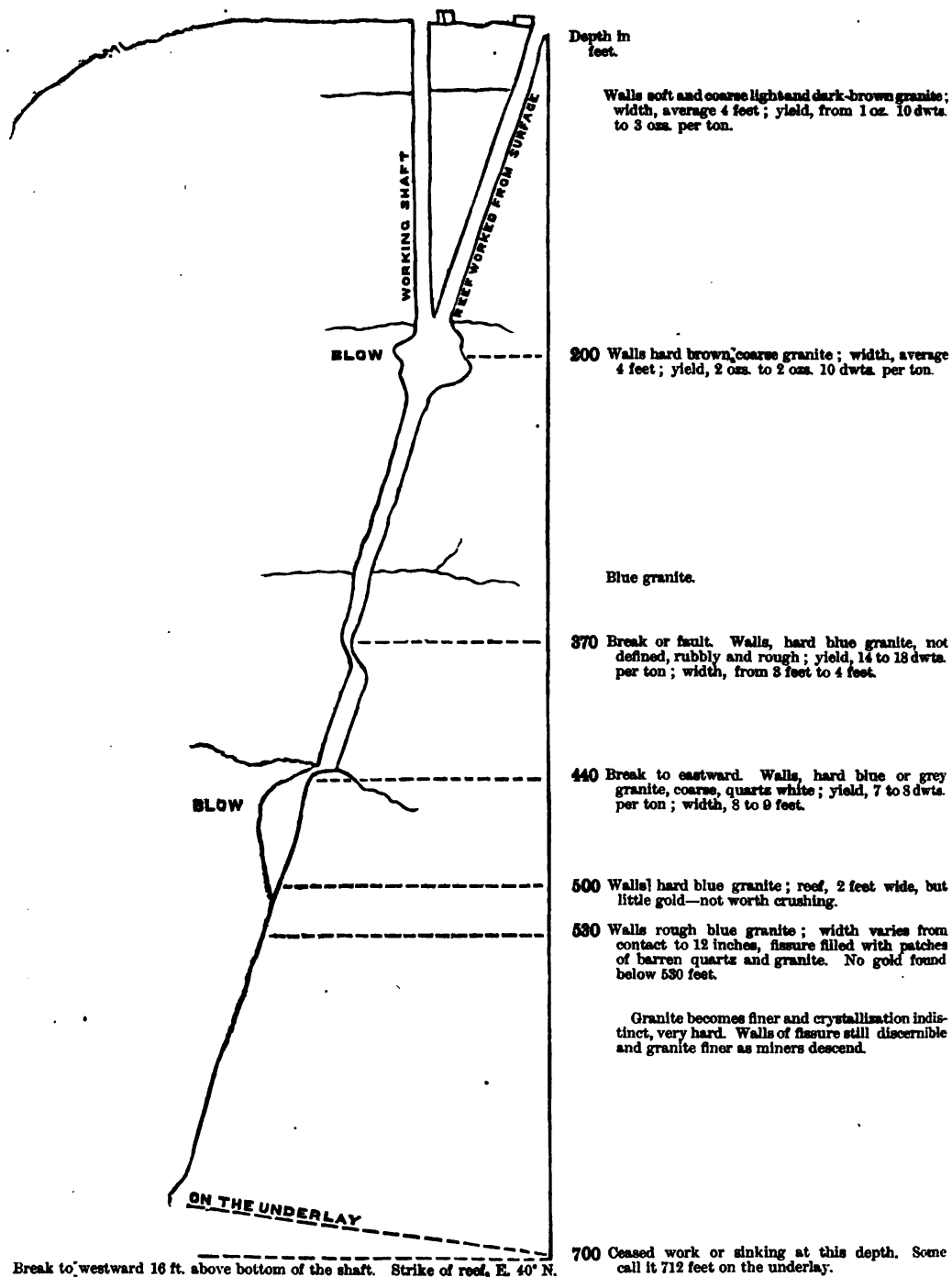
Within the granitic belt already referred to as having a north and south direction are the following quartz reefs or veins; all of these have been proved to be auriferous, and many have been profitably worked:—

O'Brien's, Grenfell New Consols,
Prussian,
Homeward Bound,
Wilson's Reef,
Lucknow,
Britannia,
Enterprise,
Welcome,
Who would have thought it?
Lawson's,
Band of Hope,
Golden Point, and
The White Rose.

The width of the belt is from 20 to 30 chains, occasionally broken by horses and blocks of schistose formation, chiefly slates. The distance between the Consols' deep shaft and the White Rose is about 150 chains; the other reefs enumerated occupy intervening positions, being separated from each other by short intervals. The general direction of these veins is from north-east to south-west; they are, however, much broken and disturbed in their course.

It is probable that within the area defined other parallel gold-bearing quartz blocks and veins may be discovered. There is ample proof that every hill along the same belt of country for eight miles to the south of Grenfell contains gold-bearing quartz-veins that have not been sought for by competent miners since the Quondong, the Two-mile, the One-mile, the Seven-mile, Prince Alfred Lead, and the Peep-of-Day Leads each pointed to their separate localities; all these leads have their source in the granitic belt, and descend either on the eastern or western slopes of the high land crossed by it. There is no gold field within the boundaries of the Western District where the gold-producing formations are more clearly defined or contained within a narrower area than at Grenfell, and no field upon which the quartz prospector could employ himself with a better prospect of success.

PLAN of O'Brien's Reef, with a section of the deep shaft in the ground held by the Grenfell New Consols Company, 3rd April, 1876.



The basin of Emu Creek, usually a dry watercourse, is enclosed to the west and north by a rugged chain of lofty granitic hills, an off-shoot from the Weddin Mountains that after a northern course of 12 miles makes a sharp detour to the eastward, and are then known as the Wanaderry Range. Many of these hills are crested with enormous blocks of a coarse grey granite, piled in the wildest confusion; they are skeletons of mountains of a past era. The eastern boundary is a spur of less elevation, issuing from the Wanaderry Range; it stretches due south for about 9 miles when it sinks into the flats that border the Tyagong Creek; in its course it sometimes rises into rounded hills, and at others spreads into a broad tableland. At intervals short spurs stretch into the valleys on either side, and these minor spurs alternate with depressions that expand as they descend. The slopes are long and gradual until they sink into the deep alluvium at the base of the range. A soft slate crops out on the summits with the exception of a solitary patch of brown granite that crowns a knoll on the southern boundary of Grenfell. This range forms the auriferous portion of the Emu Creek Gold Field; from it all the alluvial leads descend, and from it all the gold has been obtained that has been procured within 15 miles of Grenfell in remunerative quantities. The principal leads on the western slopes are the Star, the Main Lead, the One-mile, Prince Alfred's, the Peep-of-Day, and the Seven-mile, with their tributaries. On the eastern side is the Milkman's, the Slaughter-yard, the Two-mile, Stewart's, and the Quondong. At the southern extremity of the range both alluvial gold and auriferous reefs have been found, but neither yet payable; that portion of the gold field has not been sufficiently prospected, the sinking there is between 200 and 300 feet in depth through wet ground; on the west side it is between 80 and 90 feet, the deepest ground being to the southward and eastward.

On the north-western slopes irregular hills have been formed by the action of drainage, and the consequent erosion of the slates. On O'Brien's Hill (one of these) a belt of granitic rock has been denuded, and extends due south across hill and gully for about 150 chains, the granitic rock being covered to a depth of from 2 to 10 feet by quartz rubble and the debris of the slates. This granitic belt is, so far as has been discovered, about 150 chains in length by a width of 20 chains, and within the area designated thirteen (13) auriferous reefs have been worked, some of these having yielded thousands of ounces of retorted gold. Amongst the most productive were O'Brien's Reef, the Homeward Bound, the Lucknow, and Wilson's. These reefs and veins were much broken, disturbed, faulted, and dislocated, many large blocks being still unaccounted for; rubble reefs were common, and these often produced the richest quartz. It is thought that there are many parallel veins of valuable stone still undiscovered amongst these quartz workings; some of the most productive reefs were not 100 yards distant from each other.

The descent from the Wanaderry Range into the head of the basin of Emu Creek is rugged and broken; no payable gold has been obtained in that locality; neither has the portion of the field between the west bank of the creek and the granite range proved to be of any value.

All the gold transmitted from Grenfell by escort between January, 1867, and December, 1871, with the exception of a very small quantity received from Forbes, was procured from the range on the east side of Emu Creek. Since that date the Billabong Gold Field has supplied three-fourths of the entire quantity, until recently, when the route of the escort was changed.

Proceeding in a direction about 15° east of south from the upper workings of the belt of granite referred to (the White Rose Reef), a mile and a half brings you to a point where you can look down upon Stewart's Gully and the broad valley of the Quondong winding round the eastern base of the range to the northward, and worked throughout its entire length to its junction with the Two-mile Lead. Some of the claims on the Quondong proved to be very rich; the sinking was deep, ranging from 130 feet at its head to about 200 feet near the junction; its length is about 3 miles, and the descents from the range and its spurs are by long gradual slopes.

The Two-mile Lead has three branches at its head—one commencing on the eastern slope, nearly opposite to the head of the One-mile Lead; a second similarly situated with respect to the Main or Emu Creek Lead; and the third nearly opposite to the head of Star Gully. These uniting in the valley follow the base of the range to the south-east, until the

united leads form a junction with the Quondong, and thence pursue a south-easterly course for about a mile and a half further. This lead has also been much worked from the summit of the range to its termination, and was payable throughout, as on the Quondong the sinking was deep, and many of the claims very productive, the yield varying from 7 dwts. to 1 ounce per load.

Returning to the high lands at the head of the Quondong, on the opposite or western fall, is the Five-mile Lead, where many shafts have been sunk; and although gold has been obtained with occasional rich prospects, no important discovery has been made. As the valleys on this side are wide any leads that they may contain have yet to be found.

Advancing on the same southerly course for another mile you arrive on the western slope, at the head of Prince Alfred's Gully, one of the branches of the Seven-mile Rush; the former has been worked for about a mile and a quarter to its junction with the latter, and many of the claims proved to be highly remunerative.

The physical features of the country here are similar to those surrounding Grenfell. The valley is encompassed to the northward by the range and its minor spurs, these latter descending by the same long slopes into the deep alluvial deposits in the valley, and that valley opening out into the low lands that border Emu Creek. At the head of the Seven-mile valley three auriferous leads, emerging from minor valleys in the range, unite and form a main lead, that pursuing a sinuous course to the south-west has been profitably worked for a length of between 4 and 5 miles, or within a mile of Emu Creek. Nothing very rich was obtained from this lead or its tributaries; the yield of the best claims was 17 dwts. per load; the average yield about 7 dwts.; depth of sinking from 84 to 90 feet; thickness of wash 12 to 24 inches; width 20 to 40 feet, irregular. The bottom soft slate and pipeclay. The wash consists of quartz pebbles, quartz gravel, soft slate shingle, fragments of an ironstone band, derived from a sandstone formation and clays. Quartz constituted 70 per cent. of the whole wash. On the flanking ridges several auriferous reefs were found in 1867; these did not then prove payable, but were never properly tested, as they fell into the hands of men who had no experience in quartz mining; amongst others is the St. George and the West Indian, both famous in their day. The object in taking up reefs at that time was to get backers who would pay half wages; these being obtained the supposed working shareholder lay on his back all day down a hole, smoking and talking quartz; the result was that the property proved an unprofitable investment to the backers, and the reefs have had no further trial.

The Seven-mile Lead in common with many others was nearly deserted on the opening of the Bushman's Lead in 1871. There are still many portions that will pay for working and it is thought that tributaries will hereafter be traced from various reefs in the vicinity.

There are now ten parties of three men in each, working upon the Seven-mile Lead, two near the Grenfell Road, seven about 120 chains lower down, and one puddling party awaiting water. Much of this lead has been conditionally purchased under the 14th clause of the Land Act; of this the two parties, near the main road at the head of the lead, complain most bitterly—also the "Puddler," they complain that the ground has been illegally selected and surveyed, and assert that they were in occupation thereof years prior to and at the date of the selection; if they can prove that assertion to be true the conditional purchase is made contrary to law, and strikes at the root of the security of mining tenure. The seven parties lower down the lead appear to be indifferent on the subject; they say that the selector has not interfered with them. Much of the ground near the head of the lead has been so cut up by mining operations as to be valueless for agricultural purposes.

The Seven-mile Lead with its tributaries should not have been alienated; no established lead is ever completely exhausted by the first working.

On the eastern side of this part of the range is the Exhibition Reef, the Evening Star the Australian, the Fontana, and other quartz reefs, all proved to contain gold, but none yet efficiently worked. Lower down the eastern slope is the head of the Eureka Flat, the scene of frequent large rushes, but no gold has yet been obtained therefrom in payable quantities. The ground is wet, and the depth is from 180 to 250 feet, payable gold would therefore mean wash 2 feet thick, 30 feet wide, and containing at least 15 dwts. per load. A short distance beyond Eureka Flat the range sinks into the plains of the Tyagong Creek, gold-bearing reefs and gulleys continuing to its termination.

To the southward of the White Rose Reef the granitic rocks have not been denuded along the range, the surface rock being the same light coloured soft slate that crops out at intervals throughout the hill country, in this district particularly, in the vicinity of auriferous deposits.

Emu Creek Gold Field is confined to the water-shed of the Emu Creek, consequently the mining operations carried on on the eastern slopes of the range are within the Tyagong Gold Field; this latter is virtually an extension of the Emu Creek Gold Field, which is simply the basin of Emu Creek.

The alluvium of the valleys is supplied from the range on either side; it consists entirely of the debris of a soft schistose formation that rapidly decomposes and constitutes the clays of the locality; its depth is from 80 to 300 feet. The wash is everywhere the same, consisting of quartz pebbles, quartz gravel, soft slate shingle, and occasional small fragments of an ironstone conglomerate that seems to have been derived from the base of a fine sandstone of which no other evidence remains. The quartz gravel and pebbles are derived entirely from veins that traverse or intersect slate formations. On an examination of some thousands of loads of forkings at the site of old puddling machines I did not observe a single fragment of granite or granitic rock; there has therefore been two sources of supply on this field, one from quartz veins intersecting the denuded granite rocks, the other from slate formations. The bed rock in the deep leads is slate rock, much of it decomposed.

All the gold won on the Emu Creek and Tyagong Gold Fields either from quartz or alluvial workings has been obtained from the range described as forming the eastern vein of the Emu Creek basin; the leads all descend from that range and follow a sinuous course down the valleys. The quartz workings are on its north-western slopes. Auriferous reefs are numerous but those in the slate have not as yet proved payable; it is probable that at a greater depth nearer the granites they may contain more gold.

On the 28th of March last I found ten parties working at the Seven-mile Lead, four on the Quondong, four on the Two-mile, one on Slaughter-yard Gully, and three on the quartz reefs, in all 100 men employed in mining. I saw no water upon the gold field; in that respect it appeared to be in the same condition as it was during the years 1867 and 1868.

My object in thus describing the extent of the mining operations that have been carried on within the boundaries of the Emu Creek and Tyagong Gold Fields is to show what they have been, what they are, and what they may be. There are but few miners at the present time at work within their limits, but the experience of twenty-five years has proved that many important gold fields after having been abandoned for a series of years by the first occupants have been re-occupied and re-worked with profit; as an example of this I need only point to Gulgong and the Billabong.

I have but little to add to the foregoing remarks the result of my visit to this division in April last. There has been the same scarcity of water during the year as on other portions of the district, more particularly round the Seven-mile Lead where there is still a small number of men employed, and will be for years when water can be secured, as there is a large area of ground that will yield a certain subsistence to the miner, and many reefs in the vicinity that have never been efficiently worked. No application has yet been made to me for the use of the boring machine now that it has been placed at the disposal of any party at Emu Creek that will bind themselves to use it.

In quartz-mining there has been a slight revival, and several parcels of quartz from various reefs have been passed under the stampers during the year.

The average number of miners constantly employed on this field does not exceed fifty, and the result of their labour has been 1,178 ozs. 2 dwts. 11 grs. of gold for the year, transmitted to the Mint by escort *via* Forbes. Some day there will be a reawakening of the mining interest at Grenfell, as much of the district, although rich in metallic ores, is still a *terra incognita* to the miner. Stream tin is reported at the Native Dog Ranges.

The Pinnacle is half way between Grenfell and Forbes, a disturbed and broken mass of greenstone, diorite, and slate, rising from the great plains of the Lachlan, and an outlier of the Wedden Mountains. There are several quartz-reefs here that proved rich in gold, yielding from 1 to 3 ozs. per ton near the surface, but less in depth. Want of water was here

the difficulty. About 60 acres in the locality are under application for lease in 10-acre blocks, but these leases are not likely to be executed by the speculative applicants, many of whom have turned their attention to investments in land. During the year from 50 to 60 men have at intervals prospected the neighbourhood of the reefs for alluvial gold, but the want of water rendered their position untenable.

Other parties were prospecting near the Bald Hill, at Omah, who were obliged to retire from the same cause.

In the country between Lake Cowal and the Humbug Creek many rich specimens of gold in quartz and calcite have been found and leases applied for that will not be executed by the applicants, particularly those near a place known as Billy's Look-out—one of those quartz knolls from which auriferous veins sometimes ramify under suitable conditions.

In the early part of December I informed you that I had obtained some vegetable fossils from beneath the basaltic formations that fill the elevated valleys on the south-western margin of the plateau that extends from the Canoblas to the neighbourhood of Carcoar. These valleys are flanked by hills and ranges of irregular height and direction, and consist to a considerable depth chiefly of trappean products, sometimes felspathic, at others serpentinous in their character, and for the most part decomposed and increasingly pyritous in depth. Narrow fissures intersecting these igneous masses, filled by infiltration or hydrothermal action, are of frequent occurrence. The filling of many of these is slightly auriferous, and sometimes rich in patches, and are probably the small lodes that are discovered from time to time in the locality. Occasionally the fragments of a sedimentary formation, more or less altered, may be detected amidst the universal decomposition that pervades both vein and walls. Lime in some crystalline form is not uncommon in these veins, but quartz is almost unknown, and quartz sand or pebbles are seldom to be observed in the auriferous drift, the vein stones differing little from the investing rock, except in an excess of iron and lime. The absence of quartz veins is a marked feature of the district.

The weathering and degradation of the ranges anterior to the volcanic outbursts has set free some gold now to be found underlying the basalt that covers ancient channels of drainage. Their course is indicated by the crests of hills or ridges rising through the lava streams.

Thus there are two methods of mining for gold in this locality, or rather on the table-land under review. The first is to search for veins or lodes on the crests or slopes of the hills or ranges, when the formation is favourable. The second is to follow the ancient watercourses beneath the basaltic rocks at their base. In this latter formation the deep ground is often marked by long ridges or benches, as the deeper the lava stream the slower is the process of cooling, and the more compact and durable is the rock, while portions of the same stream, of a much less depth, are more scoriaceous and often more cellular and more subject to the action of disintegrating and decomposing agents. Both of these operations have been carried on upon the table-land at the head of Flyer's Creek, a tributary of the Belubula. The latter has uniformly proved to be the most remunerative.

Three quarters of a mile south of the Post Office store, at the Forest, is Tigereau Gully enclosed by ranges as above described. Here amongst five or six claims of a less depth a shaft has been sunk 101 feet upon an ancient channel which crosses the gully diagonally in a north-eastern direction; the bed rock is a decomposed trap, intersected by numerous pyritous veins; the gold-bearing drift consists of bluish clay, gravel, small fragments of various altered schists, and porphyritic traps, timber-forming portions of trees from 6 to 30 inches in diameter, fossil fruit, and other vegetable remnants. The upper part of the pieces of timber were in most instances carbonized; the lower or those portions resting on the bed rock were in good preservation and frequently retained the bark. Upon this wash reposed a laminated stratum of vegetable matter 10 feet in thickness, and saturated with water; above that a stratum of black clay, 4 feet in thickness, and over all a mass of compact basalt about 80 feet in depth. A quantity of timber from the wash and of the stratum of vegetable matter are still on the surface where they will retain their present forms so long as they are saturated with moisture, but will contract and crumble into fragments when dry.

1,200 loads of wash raised from the channel referred to yielded 3 dwts. of gold per load; the metal was from fine to $\frac{1}{2}$ dwt. pieces, slightly waterworn, unattached, and broken pyrites were abundant in the drift. As the produce of the claim was not remunerative its further working has been discontinued.

In the adjoining claims, none of which exceeded 60 feet in depth, coarse gold and fine, somewhat patchy, was obtained from a wash resting on a soft decomposed trap interlaced with large pyritous veins. There was no timber or vegetable remains.

The claims on this gold field are all wet and the country a well grassed open forest.

About a mile distant from Tigereau, on the eastern side of the gully, a range intervening, is Lumpy Swamp. Here at the base of the range is a bench of basalt about 2 miles in length; this has been held in very large claims, and at a depth of from 100 to 115 feet has been worked its entire length; the yield of gold was from 10 dwts. to 1 ounce per load, the thickness of wash from 2 to 3 feet; the direction of the channel is about north-easterly. Three claims of about 5 acres each are still profitably worked at the north end; the appliances are perfect; the puddling is carried on by means of water raised from the workings, and the wash is brought to the surface in trucks that are run on a short tramway to the machine. An extension of the workings in the deep claim at Tigereau to the north-eastward would intersect the Never Budge, the most northerly of the Lumpy Swamp claims, and in this claim the depth is 102 feet, and the sinking is through basalt and subjacent strata identical with those at Tigereau, the same basalt, the same vegetable deposits, including fossil fruits, and the same timber partially carbonized. It seems that the tree that bore the fossil fruit like the *casuarina* of the present day loved the margin of running streams. The Lumpy Swamp Lead appears to be a short tributary from the southward forming a junction with a main stream somewhere in the vicinity of the Never Budge; the other claims on this lead do not contain vegetable deposits. Any extension of this gold-field would probably be in the direction of Lucknow to the north-east.

The matrix of a large portion of the gold of this district is not quartz; and if it should prove to be a magnesian rock altered and impregnated by other trappean products it is not probable that any very rich and extensive deposits will be discovered, but I think that much of the district will pay for working, more particularly after the course of a main channel of drainage has been clearly defined.

Amongst other specimens I have forwarded this day a bottle full of fossil fruit, chiefly collected from the Tigereau and the Never Budge claims; these were plump and fresh in appearance when I received them, but are now somewhat shrivelled and must be kept in water, otherwise they will fall in pieces; also a fragment of timber from the wash at Tigereau. When I found it and selected it from amongst other fossil wood it was like a piece of board carbonized on the upper side, and one edge rounded; it cut like red cedar; it has now dried and shrunk to about half its original size and seems by some process to have been converted into carbon by exposure to the air, and has fallen into fragments. If it is thought desirable to procure a portion of one of the trees with the bark on I think I can do so. I selected some such large pieces and directed that they should be sent to me at Forbes, but they have not reached me; for these I have been waiting. In addition I forwarded, through the kindness of Mr. Warden North, of Carcoar, a small parcel of leaves and other vegetable matter in laminated layers from the 10-foot stratum.

In 1861 I obtained specimens of timber and a stratum of vegetable deposit containing fossil insects from beneath basalt, under precisely similar conditions at the Rocky River Gold-field, near Uralla, New England. These were exhibited at the first great Exhibition in London, were fully described in the catalogue of the day, and excited much attention in England.

The remaining specimens are collected from a gold-field adjoining the tableland (Cargo), and will show rich gold in a matrix other than quartz; for that purpose they are valuable.

Tigereau Claim, Forest.

Blue clay and surface soil	4 feet
Decomposed scoriaceous basalt	3 "
Basaltic boulders	7 "
Compact basalt	70 "
Compact black clay, decomposed vegetable	4 "
Partially decomposed laminated black mass of leaves, twigs, and vegetable matter	10 "
Bluish wash, containing but little quartz, fragments of calcite and porphyritic rock, and gravel with fossil fruit and timber ...	3 "
Resting upon a decomposed soft bluish rock, intersected by numerous narrow veins of pyrites	
From surface	101 "

The Hope Claim.

Forest, Lawlor, and party, sinking through basalt ; depth attained, 128 feet.

	feet	inches
Red soil surface	6	0
Decomposed basalt	10	0
Compact basalt	76	0
* Decomposed basalt, lavender clay... ..	1	0
Carbonized wood like charcoal	0	9
Vegetable matter	1	3
Pumice, partially decomposed	2	0
Highly vesicular amygdaloidal basalt, differing somewhat in its composition from the upper stream	10	0
Then a breccia, soft in patches, through which the party are still sinking	21	0
Much water.		
	128	0

Church and School land.

The sinking in this shaft exhibits evidence of two distinct eruptions

* Sample in box with fruits.

Flyer's Creek.

Gathering their waters from the swamps and valleys of the Forest, the tributaries of Flyer's Creek, descending about 500 feet, unite and flow at the base of a massive and lofty range to the Belubula. The alluvium in this valley, from 10 to 30 feet in depth, consists of decomposed trap rocks from the table-land and ranges, and is cut through by minor gullies. Here ground sluicing has been carried on extensively during the last five years by from four to six parties. Water is abundant. The races brought from the vicinity of Long Swamp, near the Forest, are constructed along the slopes of mountains at a considerable elevation, but this elevation is too far distant from the works to be of any value for hydraulic mining. The ground sluiced off varies in depth from 10 to 25 feet and extends across the alluvium. A rich deep red soil, from 6 to 10 feet in thickness, forms the surface ; thence to the bed rock is an auriferous drift, consisting of gravel, clay, and pleiocene pebbles of igneous and other crystalline rocks but no quartz. The bottom is a partially decomposed red trap ; amongst this drift gold is but sparsely distributed. About twenty miners now occupy the head of the valley, and each can earn from £3 to £5 per week when he chooses to work. The ground does not

appear to be held subject to any labour conditions although under lease ; notwithstanding this an enormous quantity of work has been done by a few men. The open cuttings are of an average depth of 15 feet, and from 2 to 4 acres in extent. It appears that any portion of the alluvium within 3 or 4 miles of the head of the creek might be worked with equal profit.

Both at Flyer's Creek and the Forest the advantage of large mining tenements is made apparent by the working of the ground, the comfortable homesteads, and the respectable appearance of the mining population.

Flyer's Creek and the Forest is about 20 miles from Cargo, as the crow flies, but the intervening country is rugged, broken, and mountainous ; however it is rich in metallic ores.

Canowindra.

The hilly country through which the Belubula rivulet winds in its course to the Lachlan River, more particularly within a circle of 5 miles round Canowindra, abounds in auriferous quartz reefs that intersect greenstone and other crystalline and altered rocks ; of these reefs several have been barely tested, and two have been worked—one to a depth of 245 feet and the other to a depth of 140 feet. Amongst others are the following :—

The Homeward Bound, width 9 to 15 inches, yield 6 dwts. per ton.

The Queen of the Ranges, width 5 to 8 inches. From this reef some very rich specimens have been obtained.

The Blue Jacket Reef, average width 3 feet, ten claims worked, yield 11 to 18 dwts. per ton, walls partially decomposed, worked to a depth exceeding 250 feet, situated on the north side of a hill behind the village of Belmore.

Hayes Reef, on the south side of Belmore hill, irregular width from 15 inches to 3 feet, yield of gold from 3 ounces to 9 dwts. per ton, richest stone near the surface.

The Jewel Reef, on the south side of the Belubula rivulet, width 9 to 18 inches, produce 9 dwts. of gold per ton.

Shannon's Reef, width 6 to 12 inches, yield 16 dwts. per ton.

Below the Blue Jacket Reef an auriferous lead has been worked in the direction of the river. Nuggetty gold was obtained from the Prospectors' claim to No. 5 ; it did not prove payable ; further on the miners were driven from their shafts by an influx of water.

During the year 1876 no mining operations were carried on near to Canowindra, and at the time of my visit I could not find any person at or near the various reefs from whom I could obtain information.

The small streams, tributary to the Belubula, on the north bank between Canowindra and Flyer's Creek, are all auriferous—near their source in the ranges, particularly along the flanks of the great belt of limestone that stretches from Toogong to the vicinity of Carcoar, passing along the base of the Ironclad Range. Nothing very rich has been yet discovered in this part of the district ; rough and mountainous it is but little known, and has never been prospected by any but persons without means, and who required an immediate return for their labour. Claims such as the Ironclad Reef at Cargo would be utterly valueless in the hands of an ordinary gold digger, and it is metalliferous veins of a similar description that should be chiefly sought for in the portion of the district to which I refer, especially amongst the broken ranges between the Forest and Cargo. Pyrites of the same character abound in both places. Patches of auriferous drift, similar to that at the upper part of Flyer's Creek, will doubtless be found under favourable conditions, but the most important mining operations will be the treatment of the pyrites that are known to be so plentiful in depth. The south bank of the Belubula has large auriferous areas in the neighbourhood of its tributaries, and many rich patches of vein stuff and alluvium have been found there from time to time, but this is beyond my district.

Cargo.

This gold-field has been so fully reported upon by Mr. Mining Registrar Hutton that there is little to add to the information of which the Department is in possession.

The most important claim is that of the Ironclad, prospector's now 336 feet deep. I recently forwarded some specimens of the veinstone taken from the 240 feet level, and also from the greatest depth yet reached (366 feet). The blue veins loaded with pyrites become more auriferous as they descend, and occasional patches of brown oxide of iron, speckled with

gold may be observed in the midst of a cluster of pyrites where a partial decomposition has taken place; lime also, in various forms, appears within the walls of the fissure as they become more regular and clearly defined. At the date of my visit the manager was about to contract for sinking an additional 50 feet, and experienced some difficulty in finding competent miners willing to undertake the work.

There are at present nine parties of gold miners fully occupied in alluvial mining, and the lessees of four auriferous tracts are proving their respective holdings. Wicker and Wickens have temporarily removed their steam crushing plant to Long Swamp, at the Forest, for the purpose of treating pyrites; and operations have not yet been commenced upon any of the tracts under application for mining upon for copper ore.

The population of Cargo now numbers 300, of whom 50 are gold-miners; this number is less by 40 than it would have been if the Ironclad Prospecting Claim was in full work.

On Boney's Rocks there has been no gold-mining during the year. Some of the reefs and veins upon which so much work has been done are worth further trial.

I have written this report with much difficulty, being nearly blind with ophthalmia, now prevalent in the district; it is caused by the dust, glare, and heat.

RETURN of Miners' Rights and Business Licenses issued in the Lachlan Mining District during the year 1876.

Where issued.	By whom.	No. of Miners' Rights.	No. of Business Licenses.	Remarks.
Forbes	F. S. Osborn	168	13	Issued by the respective Mining Registrars between the 1st January and the 31st December, 1876.
Parkes	A. B. Armstrong	658	72	
M'Guigan's	H. Margules	247	21	
Grenfell	W. F. Parker	120	22	
Cargo	R. Hutton	59	3	
Totals		1,252	131	

LACHLAN DISTRICT—SOUTHERN DIVISION.

(*Mr. Warden Robinson, P.M., Young.*)

I HAVE the honor to report that mining on the old Lambing Flat Diggings appears to have all but died out. Although 250 miners' rights have been issued from the office in Young during the year 1876 it would prove a difficult task to discover where the miners have been pursuing their labours in connexion with gold-mining during the past year. I can safely say that not more than one claim—that of Job & Co.—has been worked with anything like energy. This tenement, old alluvial ground, situated at Golden Point, has been thoroughly tested, having had, for a considerable portion of the year, a full complement of men employed and steam-engine power continually at work. The claim, however, proved unremunerative and is now abandoned.

Burns' claim has been worked during the greatest portion of the year with fair results, so has Penrose's. These are the oldest tenements on Main Creek that have been continuously under mining operations. They have considerable water storage, therefore their labours are scarcely ever interrupted. They are, however, on a very limited scale.

Miners can be discovered at Wombat, and Little Wombat Creek, but they are miners in name only,—simply holding miners' rights as an enabling document or permit to acquire the simple of properties on the diggings. The same remark applies to every portion of

this district. In fact I may go further and say that the acquisition of properties such as I have indicated is not sought after alone by those who have miners' rights or business licenses; but in all classes of the community persons are found applying for lands under the improvement clause who never took out a right or license in their life-time. In some cases I have known gentlemen of large estates applying for 2-acre portions by the dozen.

From the above remarks it will be easily gathered that gold mining in the Young division is in a state decadent,—almost complete. I am fully assured that mining interests can never be reinvigorated much less resuscitated with our present population. Those amongst us who profess to know all about mining matters seem to aim at striking some "royal road" to winning a fortune; in other words, with a few exceptions, they are the worn-out remnants of a worn-out gold field, who are as unwilling to work as they are unable to contribute capital to any enterprise whatever. The public are getting tired of being again and again laid under contribution for what is usually designated "working a point." Therefore this peculiar class of speculative-digger has of necessity also died out.

The rigour of drought which has been experienced here for the past two years must have brought mining enterprise to a stand-still had no other impediment arisen. This, however, is not the prominent cause of decadence in our mining affairs. The fact is that other interests predominate. The district is so rich in its soil and commercially prosperous, that the auriferous character of the land is left out of consideration. The most sanguine calculator cannot reasonably hope for any great reaction taking place on this gold field until statesmanship or chance casts upon it a redundancy of labour population. I may here state my belief that there is scarcely a spot within this gold field where the performance of an honest days' work will not be rewarded by fair remuneration. Nor do I think an intelligent person is to be found who will not, from the best adducible evidence, admit the strong probability that we have, in the district, an immensity of auriferous wealth remaining undeveloped. It will therefore rest with the Government of the day whether these auriferous lands shall be alienated or preserved for the benefit of a future people. Cumbermurra is particularly fancied as a field of wealth, although the recent rush there proved to many a complete failure. The Barmedman quartz claims are still under labour suspension for want of water. All the puddlers, and sluicing claims, with the two exceptions above alluded to, are idle from the same cause. The whole yield of gold for the year has not amounted to more than 1,020 ozs. Notwithstanding this falling off, so much so that the escort is taken away, and two years of drought have been suffered, yet Young keeps four banks going in full trade, and the township grows with wonderful rapidity.

SOUTHERN DISTRICT.

(*Mr. Warden De Boos, J.P., Braidwood.*)

IN reporting upon the state of mining affairs in the Southern Mining District during the year 1876, I regret that I should have so little of an encouraging nature to communicate.

Looking upon the district, as a whole, there has been during the year a gradual falling off in the number of miners at work, and a corresponding depression in business of every kind. This is traceable to a great extent to the long continued absence of the heavy rains, with which only can sluicing operations be profitably carried on. The rains, which have happily been all sufficient for agricultural and pastoral purposes, have given only an intermittent supply to the sluicers. The variation in the monthly returns of gold produced will mark very clearly the effect that occasional heavy rainfalls have upon the yield of gold. The result of this unsteadiness has been that miners have one by one dropped away from work of so precarious a character, and have sought employment in other avocations until gold fields, which not long ago were busy scenes of labour, have now an appearance very nearly resembling desertion.

The absence of floods, for which the sluicers look so anxiously to enable them to wash away the soil with the smallest amount of manual labour, has been so far favourable to Araluen as to allow the claims there to be continuously worked, and has induced the opening of a new claim on the western side of the creek near to what was known as the Old Fenians' claim, and immediately below the site of Bourke Town. Some years back this portion of the creek bank was looked upon with anxious eyes by the miners, as it was considered as payable

as any portion of the creek that has ever yet been worked. The ground, however, had been sold in township allotments, and the miners could not get at it. Since then some 14 or 15 acres of the bank have been washed away by floods to a depth of from 16 feet to 20 feet, and what were once town allotments with houses and gardens are now creek bed. With all this amount of work done ready to their hands, for these 16 to 20 feet would have had to be stripped and carted away, it appears strange that those who were once so desirous to go into the ground should now look upon it with unconcern. Possibly the expense of opening such a claim may have a deterrent effect—for the cost of stripping and carting away the superincumbent soil, ranging from 20 feet to 30 feet in depth, is very large—yet, wages are now not more than half what they were in the palmy days of the valley, whilst horses and carts can be obtained at one-fourth the price then paid. Another reason may be found in the fact that nearly all those miners who were possessed of capital have left the place, and but few remain now beyond mere working hands. These last find employment so scarce that they are only too glad to labour for half wages, leaving the other half to be paid when the gold is washed out. In the present state of public feeling in regard to mining matters, it is useless to hope for the influx of capital for the working of this ground; at the same time capital could never be better employed than now for the reasons I have given. I, however, presume that we shall have to wait for the reaction in public opinion which is sure to come some day, though the probability is that when it does come wages will be higher and other expenses greater.

The Little River Gold Field has been giving much steadier employment to the miners for the last four months than it has done for some time previously. The supply of water for the races used on the river is mainly drawn from the creeks rising in the lofty ranges of the Buddawang and Currickilly, and as these ranges from their height catch a large amount of moisture in a moderately pluvial season, the races have been fairly supplied and work has consequently been less intermittent than in other less favoured localities. For the same reason there has not been so large a falling off of the number of miners here as there has been in other portions of the district. No new ground however has been opened, and operations have been exclusively confined to ground sluicing. The reefs, many of which gave very high returns only a few years back, are left entirely unworked; and only one out of the many leases applied for on them has been taken up. Notwithstanding the neglect with which they are at present treated, I feel persuaded that the numerous lines of reef with which this field is seamed will before many years give regular and profitable employment to a large number of miners. Holding this view, I have been more than ordinarily anxious that this field should not be circumscribed by the alienation or otherwise of any portion of it. The land itself might not be auriferous, and yet its alienation might seriously hamper mining operations whenever the time may come for the systematic working of the reefs.

Major's Creek is so essentially a flooding-off field that it is only for a short time after heavy rains that any good can be done on it. The depth of soil to be carried away is often very great, ranging from 30 feet to as much as 50 feet. As the yield of gold per ton is comparatively small, any other mode of removing the alluvial deposit than that of washing away by water would be unprofitable. Thus it is only by fits and starts that the miner can here get a chance of obtaining a return for his work. The employment too is of more than ordinary hardship, for it is whilst the elements are at war and the rain is teeming down that the sluicer must be at work by night as well as by day so long as the water lasts, exposed to all the inclemency of the weather, winter and summer, for an average yield of some few grains of gold to the load. It is only the very large quantity of earth that the force of water removes which makes the work payable, and which makes it handsomely payable when the body and consequently the force of water is largely increased as in time of flood. The reefs of Major's Creek have recently received a very complete testing at the hands of Mr. Masters, an assayer of some considerable experience both in Victoria and New Zealand. He has assayed samples of stone from all the leading lines of reef here, and I regret to say that this report on them is altogether unfavourable. He has sent a report of his various assays to the Braidwood newspaper, but as he has given me to understand that he will himself communicate with the Mines Department on the subject of his experimental trials it will be desirable to leave him to speak for himself.

There have been some small finds towards the end of the year in the Mogo District, but they have been exclusively confined to patches of limited extent, and giving employment to only a few men for a short period. The Nerrigundah Gold-field has also fallen off considerably during the past year. Originally of no very extensive area, and confined to the alluvial flats which border the Gulph Creek, it has been all but worked out, and as no additional ground has been opened it offers employment to but comparatively few hands.

I enclose you return of gold purchased by the banks during the past year. In so far as the fields lying about Braidwood are concerned the return may be regarded as indicating very nearly the actual amount raised; but with respect to the fields on the coast the information is very meagre and not at all to be depended upon as showing the precise quantity washed out. Owing to the many and various channels by which the gold thence finds its way to the metropolis it is utterly impossible to trace the various parcels, and it is for this reason that I have taken into account only those amounts which can be verified; and these I may state, in so far as the coast fields are concerned, fall far short of the quantity actually won.

RETURN of gold purchased by the Banks from the several undermentioned places during the year 1876.

Month.	Araluen.	Little River.	Major's Creek.	Bell's Creek.	Shoalhaven.	Jembal-cumbena.	Mogo.	Various.	Total.
	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.	oz. dw. gr.
January	294 13 1	248 3 1	152 13 11	83 0 6	76 6 15	22 11 13	27 15 14	905 8 13	
February	191 14 0	206 5 3	103 14 8	11 18 6	45 14 6	4 0 0	18 3 12	581 9 11	
March	361 5 11	197 3 21	124 10 13	34 3 14	6 11 0	19 0 9	9 7 18	752 2 14	
April	181 18 3	206 19 1	153 2 21	20 12 17	3 2 1	18 2 23	31 17 0	619 14 18	
May	113 13 8	325 3 15	208 4 21	50 12 1	53 15 17	9 0 9	17 16 0	799 14 23	
June	125 9 13	186 17 3	162 18 0	14 13 3	55 0 20	31 18 15	12 6 18	585 13 30	
July	279 1 13	104 5 10	75 16 12	33 17 16	38 0 5	45 5 10	14 12 0	588 13 17	
August	249 7 9	228 8 9	229 18 18	7 7 0	2 13 23	11 15 0	18 2 4	742 7 11	
September	334 2 15	130 14 18	227 0 3	1 14 15	1 12 4	2 15 5	51 17 12	766 1 16	
October	210 8 9	206 5 21	219 6 3	53 17 9	53 7 0	34 3 2	16 5 22	824 5 7	
November	242 7 0	226 13 11	237 0 0	18 7 6	.....	33 9 8	12 1 6	774 2 23	
December	318 17 12	240 1 0	243 8 19	4 0 17	7 6 12	37 0 7	224 18 12	1,087 14 13	
Total	2,904 8 8	2,554 0 17	2,132 14 17	348 4 14	343 15 7	269 2 5	224 18 12	230 5 10	9,007 9 13

RETURN of gold sent down by escort from Braidwood, during the year 1876 :—

Date.	Braidwood.	Araluen.	Total.
	ozs. dwts. grs.	ozs. dwts. grs.	ozs. dwts. grs.
10 January	441 13 10	475 17 21	917 11 7
7 February	356 6 1	.....	356 6 1
6 March	468 11 14	344 0 1	812 11 15
3 April	457 5 12	.....	457 5 12
1 May	478 16 14	350 10 3	829 6 17
29 "	357 6 8	.....	357 6 8
26 June	390 4 7	.....	390 4 7
24 July	301 8 3	290 6 13	591 14 16
21 August	634 9 15	.....	634 9 15
18 September	417 13 10	334 8 1	752 1 11
16 October	556 9 21	307 9 23	763 19 19
13 November	507 2 23	133 12 0	645 14 23
11 December	513 6 13	190 11 12	703 18 1
Total	5,880 14 7	2,431 16 1	8,312 10 8

TUMUT AND ADELONG DISTRICT.

(Mr. Warden Vyner, P.M., Tumut.)

THAT portion of the Tumut and Adelong Mining District under my charge comprises the following gold fields, viz.:—Adelong, including Upper and Middle Adelong, Shepardstown, and Grahamstown; Mount Adrah, Sharp's Creek, Gilmore, including Reedy Flat, Tumbumba, Burra Creek, Maragle, Gobarragandra, including Lacmalac, Sandy Creek, and Broken Cart; Kiandra, including Nine-mile and Ournie on the Upper Murray. Over the whole of this area I have still to report great depression in mining matters. One of the principal causes, as far as alluvial mining is concerned, no doubt is the unprecedented continuance of dry weather. But it cannot be concealed that these gold fields are more or less worked out, and we must wait the advent of working on a more extensive scale with improved machinery and cheaper labour before we can hope for any great and permanent improvement. The demand for miners' rights indicates that the population is decreasing. A portion, allured by the glowing accounts from Northern Queensland, have shaped their steps in that direction; others, worn out with what they think the tedious operation of our mining laws, have gone elsewhere in hopes of finding those that suit their views better; and others, tired of mining, have left gold seeking, and betaken themselves to more certain though perhaps less exciting modes of getting a living.

Quartz mining is still being carried on with considerable spirit at Adelong, Ournie, Meragle, and Lacmalac, but the yield of gold at these places does little if any more at present than pay working expenses.

For minerals other than gold no workings are being carried on at this time, but there are rich deposits both of tin and copper which will probably be worked some day to advantage.

(Mr. Warden Brownrigg, P.M., Albury.)

THE mining operations in the Albury division of the Tumut and Adelong Mining District during the year 1876 have been like those of 1875, of a most limited character.

With regard to the Black Range Gold Field, little or no progress has been made towards its further development. In point of fact—with the exception of some abandoned ground recently taken up for alluvial working, and from which up to the close of the year between 55 and 60 ounces of gold has been obtained by a party of four men—nothing has been done in excess of last year's operations. The one claim then being worked has been carried on, but, as alleged, with indifferent success. The eight men employed making little more than wages; they are, however, working at much disadvantage, inasmuch as, in the absence of machinery, the stone raised has to be conveyed to Chiltern (Victoria, 25 miles) to be crushed. The shaft is sunk to a depth of 130 feet.

Adverting to the Yarrara Gold Field, which at one time promised so fairly, it would appear that of the several leases and claims taken up and which were for a time worked, that of the Perseverance Reef is the only one which has been continuously in operation throughout the past year, during which period some 800 tons of stone were raised, yielding as the result of crushing about 1,200 ounces of gold. The main shaft is at present sunk to a depth of 153 feet, but is to be carried down 60 feet more. There are two main levels, one a depth of 90 feet, and another at 140 feet, being in length about 150 feet. The machinery connected with the claim consists of a 14-inch cylinder horizontal engine, working an 8-inch lift (also used for winding purposes); a 14-inch cylinder beam engine, with 16 head of stampers, ripple and blanket tables complete; the number of men employed is thirteen; the width of the gold-bearing quartz varies from 4 to 16 inches.

Several other claims have been partially worked. The Just-in-Time has one shaft sunk to a depth of 70 feet, from which was raised 296 tons of stone that yielded 247 ozs. 17 dwts. of gold. The vein is said to be from 18 inches to 3 feet in thickness. I understand only one month's work has been done on this claim since the downright shaft was sunk, now nearly twelve months ago, the shareholders being all absent.

The Ranganitira claim has been also idle since last April; while being worked 740 tons of quartz were raised, which yielded about 500 ounces of gold. This claim is principally held by the same shareholders as the Just-in-Time.

The population now residing at Yarrara and the adjoining gold field at Four-mile Creek numbers about fifty, as against 200 last year; and, with regard to mining at the latter, little or nothing has been done throughout the last twelve months. At the Mountain Reef a shaft to the depth of 40 feet has been sunk, also an open cutting of 130 feet long; a small quantity of stone raised only yielded from 4 dwts. to 16 dwts. to the ton. This claim has been unworked for the last six months. There is a 14-horse-power engine with eight head of stampers, and all compliances for crushing purposes complete, standing unemployed at Four-mile Creek.

I am informed that the better prospects at Bethangra (Victoria) Gold Field has induced the lease and claim holders of Yarrara and the Four-mile Creek to devote their labour to that quarter.

With respect to mining operations in tin, I learn from the manager of the Jingellic Tin Lode Mining Company that the following work has been done:—One tunnel driven 162 feet, and another 400 feet; one shaft sunk 62 feet, and another 50 feet. That there are about 300 tons of stone at grass, and that operations with machinery will commence on the 1st February next, when twenty men will be employed; at present there are only seven.

The machinery consists of crushing plant complete, engine, boiler, and water-wheel.

PEEL AND URALLA DISTRICT.

(*Mr. Warden Buchanan, P.M., Armidale.*)

IN transmitting my Report of the Gold and Tin Fields in the Peel and Uralla District for the year 1876, I would state that no new features have presented themselves during the past year demanding special notice. The curtailment of my district has rendered it unnecessary, indeed placed it out of my power to report as fully as on the last occasion, and as the various Mining Registrars afford you full information in detail my observations are brief and of a very general character.

2. Having issued circulars to the leading owners of claims and mining managers on the various fields, I now give extracts from the documents they have furnished me; I will deal first with tin, now the most important mining industry in this district.

TIN.

3. *Cope's Creek, County Hardinge.*—Captain Swinton reports that the best claims on the creek are worked out; prospecting is going on and heavy shafts have been sunk in the back lands, giving good returns; Chinese are taking the place of Europeans. He deems this fact a sure sign of decadence; a few diamonds and many sapphires are found. He raised during the past year about 200 tons of ore.

4. *Mr. Litchfield* says: The creek is nearly worked out, but the back ground promises well; the development of the back country has been retarded on account of the various holders not working their leases; this evil is however fast curing itself. He anticipates a falling off in the yield for some time, but thinks it will be but for a short period. The field he says is a permanent one, and cannot be worked out for many years; the ore can be raised very cheaply; there are several rich lodes in the district, which will ultimately prove of immense value. Irrespective of the ore raised by his own men he purchased during the year 400 tons, and forwarded for others 100 tons. The whole of the mines are worked by tribute, at an average cost of £28 per ton, including bags and dressing; 73 to 74 per cent. is the average assay.

5. *Mr. S. W. Moore* furnishes me with very valuable reports of the various mines with which he is connected, viz.:—

The Britannia,
The Arm,
The Lizzie.

I do not think I should do justice to that gentleman by culling extracts from his papers; I have therefore ventured to attach them to this report for the information of the Honorable the Minister for Mines, who may possibly deem them worthy of publication, particularly as Mr. Moore's remarks on the leases under his management apply very fairly to most of the holdings on the field.

6. *The Wryton Mine* raised during the year 228 tons of ore, which is valued at £13,500. Mr. Wright employs forty men, and values his plant at about £900.

7. *Giant's Den*, county Darling.—The principal claim here has raised about 30 tons of ore during the year; it is got from a flat near the top of the range. Water is scarce. A deal of the ore is obtained by surfacing. The deepest working does not exceed 20 feet, and the ore assays at about 75 per cent.

8. My estimate of the amount of tin raised at Cope's Creek during the year is derived from the best procurable sources. I put it down at 2,000 tons; this I believe to be a little under the mark, and is over 400 tons in excess of the yield of the preceding year. The miners number about 500, 300 of whom are Chinese.

9. Recent discoveries have been made of rich deposits in the red soil,—a volcanic formation, the average depth of which is 70 to 100 feet.

10. I think I am justified in the belief I entertain that there will not be a falling off in the yield during the current year. Prospecting is going on continually, and with marked success, notably by the Union Tin Mining Company, and as the unworked leases declared forfeited are being taken up afresh by those who mean work, I feel warranted in auguring fair results for the year 1877.

GOLD.

11. *Rocky River*, county Sandon.—Herewith I beg to attach the report of Mr. Henry Roman, as regards the Long Tunnel. The same reasons apply to this document as those adduced by me in regard to Mr. Moore's report. The paper will doubtless be read with interest.

12. Nothing further of importance occurs to me as regards this old gold field. Except during heavy rains but little work is done; then, whilst the water lasts, sluicing is resorted to wholesale, and very fair returns are obtained.

13. *Glen Morrison*, in the Walcha District.—Saving Kitcher, Stretton & Co.'s claim, Golden Star Reef, but little work has been done in this locality. The main shaft of their claim is down 110 feet, and they do not anticipate cutting the reef under 200 feet. It is stoutly timbered throughout; work is being carried out on the 100 feet level; the dip averages about 1 in 4, westerly; the reef bears N.N.W. Taking the stone all round, good and bad, it has averaged 5 ozs. 11 dwts. per ton, is easily obtained, and not difficult to crush; many tons of picked stone have averaged 80 ozs. to the ton. There is a good fifteen-head stamp battery about 2½ miles from this reef.

14. The remarks on this field made in my last report still obtain; the quartz is undoubtedly very rich, and it is a matter of surprise to me the field does not command greater attention.

15. I regret my inability to furnish this report earlier, but it being based on information derived from practical people on the various fields, and as their reports only reached me a day or two since, it was impossible for me to transmit it at an earlier date.

(REPORT BY MR. S. W. MOORE.)

The Britannia Tin Mining Company.

Head quarters are situated at the junction of Cope's Creek and Darby's Branch, on land applied for as conditional mineral purchase, containing 240 acres, on which also is built the township of Tingha.

The largest part of the Company's leased land is on Darby's Branch, where until recently the principal workings have been carried on. The usual depth of deposit is about 6 feet in the bed of the creek, and from 12 to 15 feet in the flats, or what is commonly called "made ground."

The height of wash varies considerably, in some places there being only an inch or two, and in others several feet; from 6 to 18 inches may be taken as a general average. The width of wash is decidedly narrow, seldom exceeding 15 feet, and may be averaged at 10 or 12 feet.

Here I would note two important facts, viz.:—1. That as a rule the main body or run of wash takes its course along the right bank of the creek; and 2. That the best "surfacing" is to be found stretching away from the creek, on the left bank.

In addition to the creek ground this company holds a few back blocks, principally "surface" land. The "surfacing"—i.e., from the grass roots to the clay—averages from 1 foot to 18 inches, through which the tin is very irregularly scattered. Not unfrequently the tin is found mixed with the clay, or passing beneath the clay is deposited in a kind of wash lying on the granite; as a rule, however, in mere "pot holes." I cannot give an average width of "surfacing," there being no regularity whatever about it. The dirt is generally thrown into a ground sluice, and considerably reduced before passing through the box, which means in plain English that "surfacing," generally speaking, will only pay by being ground sluiced. On account of the scarcity of water this company's "surface" blocks have during the last two or three months been almost at a standstill.

The quantity of ore raised for the year 1876 is nearly 165 tons, of which 140 tons were obtained for the nine months ending September 30th. The falling off in the yield for the last three months of the year is traceable to two causes: (1), the scarcity of water, which, as I just mentioned, placed the surface blocks at almost a standstill; and (2), the fact of several important creek claims having been worked out.

The average number of men employed nearly 40. With the exception of horse-power no machinery is used. Value of plant, in round numbers, about £100.

No reefing is being carried on at present by this company. I might state, however, that some time ago a shaft was sunk on a small tin reef, running east and west through the company's land near the township. The sinking was comparatively easy through freestone; but after going a depth of 50 feet, and putting in a drive about the same distance at the 45 feet level (east), the project was for the time abandoned. The reef was from 6 to 9 inches wide, with a vein of tin about an inch in width running through it.

In conclusion, I would just remark that this country is stocked with small leaders and reefs, which doubtless have fed the present stream deposits and the "surfacing." Some of the reefs have good indications, and are well defined, and though a few have been tested (after a fashion!) and condemned, I am sanguine enough to hope that the day is not far distant when the noise of the "stampers" will be heard on all sides, for I feel convinced that when properly worked some of our despised reefs will gradually develop into permanent lodes, and Cope's Creek will become a "great reefing district."

The "Arm" Tin Mine.

Is situated in the parish of Swinton and county of Hardinge, on the lead known as "Dick Jones's Lead," so called from the fact of Jones being the discoverer.

There is a narrow belt of basalt running nearly east and west, and bounded on either side by granite mountains.

About 4 years ago Mr. Wilkinson (Government Geologist) rode over this very ground, and being struck with the formation of the country he then confidently asserted as his belief that tin existed in payable quantities beneath the basalt, and I am told even went so far as to strongly advise prospecting. But at that time, when tin was so easily obtained in the creeks and gullies and on the surface, it was no wonder that even practical men flinched from the task of breaking through a solid mass of basalt, the extent of which no one could tell, on mere spec. And it was not until Jones, some considerable time after, undertook and completed the task, that the geologist's prediction was confirmed. Hence this splendid lead bears the name of the persevering and plucky prospector.

The "Arm," which is the second claim on the lead has been working only about eight months, during which time 25 tons of ore have been raised, the average number of men employed being about nine.

The depth of deposit is between 60 and 70 feet; the sinking, with the exception of a few feet of pipe-clay and drift sand, being through basalt. The height of wash varies from 6 inches to 3 feet, averaging about 1 foot. The width of wash is from 40 to 50 feet. No machinery is used, and the whole plant may be valued at £20.

Here I would observe that the nature of the wash, which contains beautifully water-worn pebbles, &c., with other circumstances, point to the conclusion that this is the bed of an ancient river or creek, which at some remote period wended its silent course through the mountains, until by volcanic action a stream of burning lava was thrown into it, burying it up, and forming when cool the present stratum of basalt.

The "Lizzie."

Is the fourth claim on "Dick Jones's Lead," and differs only slightly from the "Arm." The depth of deposit is not more than 50 feet. The height of wash averages about 18 inches: the width of wash is from 35 to 40 feet.

The quantity of ore raised for the year is nearly 50 tons, the average number of men employed being about ten. No machinery is used, and the plant may be valued at £20.

The average local price of ore for the year 1876 was about £31 or £32 per ton.

REPORT ON THE LONG TUNNEL CO.'S MINE AT ROCKY RIVER GOLD FIELD.

(By Mr. Henry Roman, M.M.B.)

In response to your request for information respecting the workings of the Long Tunnel Gold-mining Co. (Limited) at the Sydney Flat, Rocky River Gold Field, I beg to furnish the following information, regretting that an extraordinary pressure of business, and circumstances over which I had no control, have prevented me earlier attending to this matter.

In April, 1876, this Company was formed, with a capital of £3,000, for the purpose of working auriferous deposits upon the Sydney Flat, by means of an adit from the face of Mount Jones. The ground intended to be worked by the Company was originally dry, but being deserted in the earlier days of the gold era, and the shafts left unsecured, the springs and surface drainage have so flooded it that it has been rendered unworkable by ordinary means. The Company having secured the right to mine under a large extent of private property, in addition to the Crown land taken up under Mining Act and Regulations (in all about 50 acres), on the 6th September commenced driving their tunnel—the open cutting, extending about 60 feet in length, having been then completed.

The progress made was for some time very satisfactory, the working being in a decomposed granite. When about 450 feet in with the tunnel, the working party struck hard granite boulders embedded in what appears to be a bar of coarse open granite, and blasting had then to be resorted to. This latter rock and boulder still continues, and the distance to which the tunnel has now been carried is about 640 feet. It is anticipated that 40 feet more driving will cut through the bar, and then the rock being of a character more easily to be worked, progress will be more rapid. The extreme length of the tunnel, from its commencement to the termination of the Company's ground, will be about $\frac{1}{4}$ of a mile; but at about 1,600 feet it is intended to commence working the auriferous drift, at the same time carrying on the extension of the main drive. When the mine is in full operation it is anticipated to employ about sixty or eighty men in its workings; beyond this, a large extent of good payable ground outside the company's claim will be rendered capable of being payably worked, and this will, of course, be open to the general mining public.

This undertaking is one of the few legitimate mining ventures, and under proper management will doubtless prove one of the most permanent and remunerative mines in New South Wales, at the same time employing labour and rendering that which has been lying waste and idle many years a rich and valuable property.

PEEL AND URALLA DISTRICT.

(Mr. Warden Irving, P.M., Tamworth.)

LAST year I was compelled to give a very melancholy report as to the state of the gold fields at Nundle (including Bowling Alley and Hanging Rock) and at Barraba (including Ironbark and Tia Tia Creek).

2. I regret now to report that since the end of last year the depression in mining affairs in these neighbourhoods has continued. The mining population has still further dwindled away.

3. I have not during the twelve months been made acquainted with one single new fact in any of the branches of information I am supposed to supply in my reports.

4. The only enterprise being in any way successfully prosecuted on the Peel is the quartz-mine known as the Marquis of Lorne. This mine is not, however, on the Crown lands, but on the estate of the Peel River Land and Mineral Company (Limited). This mine, I believe, is fairly remunerative. I can only hope the reef may be traced on the Crown lands side, or some other discovery take place, to revive the mining interests.

5. There is no other but gold-mining prosecuted in the district under my charge.

(Mr. Warden Brougham, P.M., Bingera.)

In submitting this my first report of the district under my charge, owing to the short time I have been resident here the information cannot be so full as I would wish. The mining population in the vicinity of Bingera is but small, only amounting to fifty-eight. The gold is very patchy, still some miners make good wages; there has been a prospecting party out for some weeks, but thus far they have not been successful. At "Bobby Whitlow" a party has taken up a block on which there are remarkably good indications of payable copper, which when opened up will prove a profitable speculation to the parties who are working it. I have seen some specimens which ought to turn out 30 or 40 per cent. of copper; should the lode be found to extend any distance it may be advisable to erect smelting furnaces. From what I have seen of the country about here I think gold is to be found in payable quantities. At the Barraba Gold Fields the number of miners is small, and seem only to search for gold when shearing and harvesting are over. The introduction of good machinery would cause a greater yield of gold.

NEW ENGLAND AND CLARENCE DISTRICT.

(Mr. Warden Graham, P.M., Tenterfield.)

I do myself the honor to report on the mining district under my charge. It is very satisfactory to find that the tin mining industry in this district continues in so flourishing and satisfactory a state. It is now nearly five years since tin was first discovered and mined for in this district, and since then, in defiance of such adverse circumstances as this particular branch of mining has been subjected to and had to contend with, it is still a highly remunerative and large labour employing industry.

When mining for tin first commenced (early in 1872) the ore was worth, on the ground, about £70 per ton, the price gradually decreased until it reached barely half that value. At its lowest price, about the middle of the year 1876, it was only worth on the ground about £34 per ton; added to this extraordinary and unforeseen decrease in price, which would alone have paralyzed anything but a sound and remunerative industry, it had also to contend against the mining depression of 1873 and 1874. This depression then particularly influenced, and does still, our tin mining industry, as on the first rash speculation and over-estimate of value (together with the great fall in price of the metal) tended to shake the confidence of capitalists to such an extent that up to the present time little or no capital has been expended in prospecting or developing the numerous lodes or veins of tin that abound in these tin fields, and only the alluvial deposits which are immediately remunerative (with the exception of some deep ground prospecting at Vegetable Creek) have engaged the attention of miners.

The rich and shallow portions of the alluvial deposits, such as the beds of present watercourses, are now being rapidly exhausted, but discovery of older and more extensive beds and deeper deposits more than keeps pace with the exhaustion of the present creek beds.

I must refer you to Mr. Warden's Clerk Gower's very excellent and carefully compiled report on the Vegetable Creek mines, from which it will be seen that the successful deep ground mining has given an impulse to prospecting which I have no doubt will lead to results that will increase the value and stability of the alluvial mining in that vicinity, and will also encourage a more general prospecting of our great and extensive tin fields. Already very encouraging results have been obtained in the Maryland mines from prospects taken from places not now indicated by surface watercourses. This will, I have no doubt, induce further prospecting and tend to the development of rich deposits now unknown.

On the Queensland side of the main range, where surface indications and character of country are similar to that on our own side of the range, a mine equal in richness to the celebrated Vegetable Creek Tin Mining Company's mine has been discovered, and has now been working for some eight or ten months. The depth of the deposit is from 50 to 80 feet, having, in some places, a depth of wash-dirt of 10 feet, black with tin ore. The extent or width of the deposit is not yet ascertained.

The now gradual increase in price of tin is holding out a more cheerful prospect, and if it should continue until the ore is worth £50 per ton on the ground, a vast quantity of land not now payable will be taken up and worked.

The Mole Table-land Mines although of great extent are almost deserted in consequence of low price of tin, and almost impossibility of carriage. A revival in price of tin will again populate these extensive mines. I am inclined to believe from the formation of the country and the numerous discoveries of rich lode indications that the Mole Table-land will one day become a great mining district.

As an evidence of the great importance and value of the tin mining industry I may point out that during the four years ending in 1876 about 11,000 tons of tin ore have been won from the Vegetable Creek mines alone, and I should estimate that the supply from the other mines in the district, Mole Table-land and Maryland, during the same period would not be far short of 10,000 tons, making in all about 21,000 tons of tin ore. The average value of the tin ore during the period named would be about £50 per ton, making a total export of tin of a value of *over a million of money*.

The yield for 1876 of the Maryland tin mines I think falls slightly below that of 1875. As only an approximate estimate of this yield can be obtained, I would submit my estimate of the quantity, after careful inquiry, at about 1,500 tons. The reason why reliable information cannot be so readily obtained on these mines as on the Vegetable Creek is in consequence of their distance from the nearest Warden's Office, or Mining Registrar's, and the difficulty of getting by correspondence the necessary information from the managers and miners; the falling off in yield is attributable to the protracted drought the district has experienced, rendering it impossible to wash for four or five months during the year. Now the drought has broken up, the mines are again in full and active work.

Two thousand one hundred (2,100) acres of land have been applied for under mineral lease during 1876; this shows a very great and satisfactory increase over 1875, which only amounted to 1,200 acres; besides this there have been a number of leases converted into mining conditional purchases.

In my last year's Report I did myself the honor to suggest that a reward should be offered by the Government for the discovery and development of a payable tin lode mine. I would respectfully renew this suggestion. I feel confident that the tin mining industry in this district is only in its infancy, and that the development of a payable lode would induce the expenditure of capital and tend to do away with the want of confidence at present shown by capitalists. The extent of tin-bearing country, the great richness of the alluvial deposits, and the splendid indications of rich lodes to be found in this district, augur well for its prosperity and the permanence and increase of its tin supply.

GOLD.

I regret that I cannot give such a favourable account of the gold mining in my district; there appears to be a great want of enterprise and capital, and little or no efforts are being made to develop a prospect.

The few gold mines are situated at remote distances from my head quarters, and as yet I have not had occasion or opportunity of visiting. The supply of gold is very small; the want of machinery is one great drawback to the development of the mines. Boonoo Boonoo Gold Fields are almost deserted—only a few men engaged working old alluvial claims. From the opinion of practical men I believe good payable reefs exist in this gold field, but the want of machinery compels them to lay idle.

At Lunatic and Perseverance there are about twenty-five men engaged, and they appear to be getting good gold; there is a small battery on the ground and what stone is crushed yields well.

Timbarra Gold Fields are almost deserted. There is a sluicing claim at Poverty Point on which I believe the holders intend to expend some capital to bring a race and to develop the claim which promises to be of great value. A few men are working in M'Leod's Creek under miners' rights. Boorook is now completely abandoned. Dalmorton, from its remote position, and my presence not being required, I have not yet visited. Cangai and Tooloom are similarly situated.

A new reef, of which report speaks very highly, has recently been discovered at a place called Slatey Creek, about 8 miles from D'Arcy's, and about 25 miles east of Tenterfield. On the road to Grafton a prospector's claim has been secured, and two leases, one of 12 acres and one of 4 acres, have been applied for.

I intend (with the sanction of the Honorable the Minister for Mines) to make a complete tour of the gold mines in my district as soon as I can conveniently arrange it. On my doing so I will be in a position better to report on their prospects and value.

MINING REGISTRARS' REPORTS.

BATHURST DISTRICT—BATHURST DIVISION.

(C. E. B. Maybury, Mining Registrar.)

GOLD mining within the district is almost at a stand still, the only place exhibiting any life in this respect being Mitchell's Creek, of which you will have a full report from the Mining Registrar there stationed. Within this division beyond that carried on by a few prospecting parties and small claimholders there is no sign of gold mining, and I am not aware of any prospect of improvement. The quantity of gold transmitted by escort from Bathurst to Sydney during the year amounted to 5,178 ozs. 16 dwts. 10 grs.

The copper found within this district is generally associated with cuprite and malachite, and to a smaller extent with chersylite. The principal mines occur at Cow Flat, Dirty Swamp, and Apsley.

Of mineral lease applications I have received a number during the year, the land in most cases being situate at Mitchell's Creek, and the intention of the applicants to mine for copper. At Mitchell's Creek gold mining is carried on to a considerable extent with fair results, and the land *throughout* gives evidence of an auriferous nature. Whether the yield of gold would be sufficient to repay the outlay necessary to work the ground *generally* I am not in a position to say. I have received one application for a lease of 20 acres, with a view of mining for galena, and in two other similar applications the metals to be sought are lead and silver. In each case the land is situate at Mitchell's Creek.

During the year I have received only nine gold mining leases, applications embracing an area of 64 acres; and twenty-one mineral lease applications, embracing an area of 720 acres. I have sold 79 miners' rights, and six business licenses.

Population.

I have been unable to obtain reliable information respecting the number of miners in this division, the following being only an approximate:—

	Europeans.	Chinese.
Gold miners { Alluvial	25	50
{ Quartz	10	20
Other miners	100	...
Totals.....	135	70

There are no miners within this division employed in mining for metals or minerals other than those referred to.

Cow Flat Copper Mining Company.

Different description of ores are raised, but as they are not separated the quantity of each cannot be given. The ore contains zinc and different kinds of iron ore, none of which are saved.

Armstrong Copper Mining Company.

The ore contains red and black oxide, green and blue carbonates, iron ore, and sulphurite of copper. Quantity of each not known.

BATHURST DISTRICT—TRUNKY DIVISION.

(Thomas Waldie, Mining Registrar.)

In submitting this my second annual report upon this gold-field, I have to regret that I am not in a position to record any advance in our mining prospects from last year. Quartz mining is at a complete stand-still, and alluvial can be considered in very little better condition.

But this state of depression is not because the reefs do not contain the gold, as will be seen on referring to the returns that the yields are scarcely to be beaten by any quartz-reefs in the Colony, but there seems to be a great lack of enterprise in developing the hidden treasures of this field; and perhaps the circumstance that would most attract the attention of a stranger is that, with the exception of one individual, not a single tradesman in the place can show that he ever speculated £5 in the development of either a quartz or alluvial mine, which circumstance might lead one to infer that they have very little faith in the field, although most of them have been in business here for many years. Now it is a well-known fact that the most important gold-fields in Victoria were developed and carried on through the enterprise and liberality of the business people, some by paying half wages and supplying the miners with the necessaries of life during their prospecting, which in many cases lasted for years; and if the business people in this Colony would follow the same course many payable claims would be working that are at present lying idle. One most unfortunate circumstance in connection with the progress of this place is, that the township covers the most auriferous parts of it; and although the Mining Act provides for the working under public roads, yet that privilege is almost a dead letter, because the deposit required is so heavy that miners cannot afford to let the money lie idle, as it in many cases constitutes

their whole working capital. The consequence is, the permits are sent back, and the gold, which is known to be in the ground, is left there, which means a loss of so much capital to the Colony. It is a well-known fact that after a heavy fall of rain the children pick up the gold in the streets, and pieces have been picked up varying from 4 to 7 pennyweights. I would suggest to the Minister for Mines that in dealing with applications to mine on or under the roads and streets, that the applicants should be most liberally dealt with, and every encouragement given to the persevering and industrious miner, because it is impossible to tell what results might ensue from even the prospect from under a road, and, with the exception of the main street, every other street in the township could be taken away for the depth of four or five feet, the gold washed out, and the street be actually improved instead of injured.

I think it was a great pity that the Government Geologist, Mr. Wilkinson, did not pay this field a visit, for I am under the impression that he would have thrown such light upon its character as would have placed it in a very high position in the estimation of enterprising capitalists. I believe a testimonial from him would do more for it than anything else.

Having said thus much I will now proceed to give an outline of what has been done for the year. In quartz I will commence with

The King of the West.—This mine is sunk and worked to the depth of 500 feet, from which quartz yielding from 1 to 3 ounces per ton has been taken, but owing to the great depreciation in the value of mining property, the heavy water to contend with, and the difficulty of raising capital, the mine has remained at this depth for a long time. A good deal has, however, been done by tributors working above the water-line, and from which good results have been got; and I feel quite sure if enterprise and capital were brought to bear upon this mine that at 800 feet the Government bonus of £1,000 could be claimed, even if 200 tons of payable stone were required. The yield during the year has averaged 1 oz. per ton, and has paid the tributors about £3 per man per week.

The next is the Trunkey Creek Gold Mining Co.'s Mine.—This mine is worked to a depth of 300 feet, but from the same cause as the King of the West this mine is also at a stand-still, as far as working below the water, but a good many tributors have been working it above the water-line, and have made good wages, the stone averaging 15 dwts. per ton.

The Alma Gold Mining Co.'s Mine is worked to a depth of 300 feet, but nothing has been done at this depth for some time as the water is heavy and expensive to keep down with a horse whim; but a few tributors have been working above the water-line, and good payable stone taken out. The average yield has been 18 dwts. per ton, and has paid from £4 to £5 per week per man. This mine, I venture to say, is one of the best in the Western District. It has been at work for 7 years, with short stoppages, and has paid from £3 to £5 per week per man the whole time.

In alluvial very little indeed has been done for many months owing to the unprecedented dry weather. Prospecting has, however, been persevered in by those who hold payable claims but are unable to work them for want of water. One prospect was shown to me by one of the prospectors, taken from beneath the trap rock where they are prospecting, which looked well. There are many miles of this trap-rock country here, from some of which as much as 7 ounce nuggets have been found, but the great drawback is the water.

The Pine Ridge, or Hell's Hole Mine, contains one of the finest lodes (quartz) in this part. It is opened 60 feet wide and not through it. The quartz was originally crushed with steam power, but owing to the great expense of fuel in such a mountainous country, a large water-wheel, 40 feet in diameter, has been erected to work the stampers. I cannot say much about it at present as they are not able to work for want of water. Should it turn out payable it will be one of the best investments in the Colony, as there is an unlimited quantity of material to work upon, and, in ordinary seasons, plenty of water the whole year round.

BATHURST DISTRICT—TUMBA DIVISION.

(S. J. Cotter, Mining Registrar.)

REFERRING to my remarks at page 63 of the Annual Report for 1875, they are still generally applicable to the state of affairs. Nothing is doing in quartz-mining, except at Towns & Co.'s famous "Washington" lease at Junction Point, where, in 1873, a very rich reef ran out or was lost after yielding a profit of £20,000. Practical miners seem to think they cannot speak too highly of the pluck, skill, and devoted energy with which Mr. R. Zouch, the manager, has carried on prospecting operations in search of the lost reef, and it is just reported that he is at last successful.

Alluvial mining preserves the even tenor of a very monotonous way. It is carried on in the simplest and rudest manner, with the most primitive means. Water is brought by forming dams in the main creek, and thence by races to the points or flats in its tortuous course, which proved rich when first worked in the palmy days of the gold field. In wet seasons excellent streams are also obtained from several tributaries of the main creek. These points are usually worked right out of face in open cutting at a depth of from 5 to 15 feet. At from 20 to 40 feet shafts and drives are resorted to. No mining appliances are met with but the eternal pick, shovel, cradle, and a few flumes. Deficiency of water often brings things to a standstill, but I have no doubt that whenever there is a fair stream very good wages are made. With every desire to avoid the florid style of a mining manager, reporting on and trying to float a doubtful claim, I may remark that in all likelihood here is a remunerative field for hydraulic mining, or mining conducted with the economy and system which is at the command of capital alone. The field held its own for upwards of twenty years, first as a rich one, long afterwards as one where wages and "tucker" at all events were safe.

Many of our miners are natives of the locality, able to take a turn at fencing, shearing, and other works which is exceptionally paid. This is a great advantage to themselves, as their means of livelihood are much less precarious than when depending on the supply of water, and the unequal and uncertain remunerations of the miner's toil, and the pursuit of gold-mining is injured but little. Few who have once been miners can long forego the stimulus of its bright hopes, and the tempting chances of its rich rewards. They are almost invariably safe to return to it whenever they can do so to anything like advantage. Nothing however can tempt a few of the very best of our miners to swerve in their allegiance to particular localities. They have unlimited confidence in the auriferous character of the country around them. I may briefly describe it as mountainous and wild, covered with pointed peaks and sharp serrated ridges. The prevailing rock is slate of every variety, the strata tossed at every conceivable angle. Quartz reefs abound, as do also limestone, iron, and traces of copper ores.

The division is fortunate in possessing the important and productive Peelwood Copper Mine, where all appearances indicate good management, steady returns, and confidence in the future. The mine supports a village with a population of about 500, all told, and seems to provide its business places with their full share of bustle and activity. Seventy-five miners and about thirty teamsters find constant work. It is almost a blessing to the unskilled labourers, as numbers of them find profitable work cutting wood for the furnaces. The management is credited with skill, economy, and judgment, and a large quantity of ore, expected to prove of high percentage, is in process of extraction. R. N. Williams, Esq., the manager, has been good enough to give me the following information:—"During the present year the mine has been sunk diagonally 120 feet, making a total depth of 420 feet from the surface; bearing of lode, north and south, underlying eastward, at an angle of 45°; containing copper, silver, lead, and zinc, still continuing to go down, varying in thickness from 1 to 20 feet; matrix, micaceous schist. At the north and south points of the workings the lode contains some very rich oxide of copper, and malleable, but the bulk of the sulphuret ores contains a conglomerate of foreign metals. Throughout the mine there is an abundance of lead ores, containing a good deal of silver, which is being smelted with the copper ores, rendering the produce in regulus, which contains from 40 to 50 per cent. of copper, 30 to 40 per cent. of lead, and from 100 to 180 ounces of silver to the ton. The yield for the year will be about 350 tons of regulus, worth at least £50 per ton. Working plant consists of two large portable engines, with crushing and dressing machinery, four reverberatory furnaces, and a calciner. The latter is used for desulphurising and expelling fumes of zinc, preparatory to smelting operations; otherwise there would be great difficulty in obtaining a separation of the slags and metals."

I have also to acknowledge the kindness of the legal manager, George A. Russell, Esq., who was good enough to direct that any information required for the Department should be supplied.

BATHURST DISTRICT—CARCOAR DIVISION.

(W. Badcock, Mining Registrar.)

THE year 1876 has been on the whole a quiet one for this district as far as regards the working of its auriferous resources. It opened with a great rush of miners and others to Mandurama, about 5 miles from Carcoar, to prospect the Icely Estate, which on last Anniversary day was thrown open for gold mining. After all the extravagant expectations that had been formed of the mineral resources of the Coombing property, nothing was found to justify those expectations, and the only place in which any payable gold was discovered was in a gully leading from the main road to Cowra to the Belubula River, in which a small alluvial lead was discovered, which gave the name of the Golden Gully to the place in question. A few men found employment at this spot for several months, making wages, but of the thousands who came into this district with the rush probably not one in fifty remained longer than the end of February. Many of those who left wished to prospect the district, but the great scarcity of water at the time, except in the main creek, prevented prospecting on any considerable scale. It is probable that if the season had been a wet one some lasting good may have resulted from the rush by the discovery of new and payable gold-bearing localities.

Quartz Reefs.—All the old reefs in this district seem to be getting poorer, and more difficult to work. On the Belubula River the magnificent plant of the Junction Company has been sold for about a tenth of its value after the works had been closed about eighteen months. The purchasers, however, have set the machinery going, but only for so long a time as the stock of firewood on hand shall last. The plant of the Frenchman's Company on the other side of the river has also been sold for a trifle. The Cornishmen's, a little lower down the river, is idle also. These companies were working very successfully for some time, particularly the first-named. The stone mined was a soft quartz found in the hills close to the river, lying in immense horizontal reefs of considerable thickness, one worked by the Junction Company being of the great thickness of 18 feet. The richest stone in either of these three mines went about 5 dwts. to the ton, the average being about 3 dwts. Latterly it dwindled down to 1½ to 2 dwts., which did not pay for working. Several mining engineers of experience, who have seen these mines, are of opinion they would all pay well if worked by water power by means of turbine wheels, thus saving expense of fuel, firemen, &c., and at the same time obtain the stone by quarrying, instead of mining, which would effect a still greater saving. There are still immense deposits of stone in the hills close to the river, which, it is believed, would yield from 1 to 2 dwts. per ton. Doubtless in the future these resources will be utilized. The Brown's Creek mine has been the most productive one in this district, during 1876 the quantity of stone raised being 19,650 tons, which gave a return of 2,571 ounces of gold, or an average of 2 dwts. 15 grs. per ton. The greater portion of the stone is obtained from large open workings like quarries, the whole of the stuff obtained being put through the machine. This claim stopped working for a few weeks in the latter half of the year, as owing to the heavy original outlay for machinery the company was encumbered with a heavy mortgage. The plant and claim were at length sold by auction, and work was

re-commenced, and is now being carried on *unsuccessfully*. The old claim of the Prince of Wales Company at Burnt Yards is the only other quartz claim working in this locality. The operations of this company have only been on a small scale during the past year. This is the deepest mine in the Carcoar district, being over 400 feet in depth.

Alluvial.—Most of the alluvial working in this district is now carried on at Flyer's Creek, Lumpy Swamp, and the Forest, on the Church and School Estate. The operations of the year have been much retarded in places by the want of water. Those at Flyer's Creek (Jarvis and party, and Page and party, being the principal claims) are worked by sluicing, the whole of the surface soil being washed away on the face. A little further on, at Lumpy Swamp and the Forest, the mining is still alluvial, the gold being found in a lead 70 to 100 feet in depth. The geological formation in this locality is very curious. After sinking through 60 or 70 feet of trap rock, remains of vegetable matter are found, such as trunks of trees, nuts like quandongs, leaves, &c., all quite black, but otherwise in perfect preservation. The lead of gold beneath this is very good, but the expense of sinking is great, from the hardness of the rock and the great influx of water, met with even in the driest season. This is a place, where, I think, a moderate capital could be profitably invested in working claims on a sufficiently large scale to warrant the purchase of efficient steam pumping apparatus. The present method of drawing the water up in a caulk is both costly and ineffectual. Nothing new has been discovered in this locality in the past year. The principal claims worked are Kearney and party, C. Hemmicks and party, and Hennessey and party. There is a little alluvial working carried on in the Balubula, and a few other creeks, by Chinamen, but only on the smallest scale.

The quantity of gold taken down by escort from Carcoar in the year 1876 was 8,548 ozs. 13 dwts. 8 grs.
 1875 6,565 14 14

showing a falling-off of over 3,000 ozs. in one year."

Copper.—On the other hand, the copper resources of the district are being steadily developed, the Milburn Creek and Coombing Mines having during the year given employment to a large number of miners and others. At the former mine three furnaces are now at work, and at Coombing one has been in operation for some time, and another is in course of erection. Work has also been commenced at one or two other places with good promise of success. It is to be hoped that the result will compensate the district for the continual decline in the yield from its gold mines.

BATHURST DISTRICT—COWRA DIVISION.

(John Atkins, Mining Registrar.)

I HAVE the honor to forward herewith my annual report on gold mines within my division of the Bathurst Mining District for year 1876.

The portion of the Bathurst Mining District included in my division consists of only a small area, being comprised within that portion of the county of Bathurst situated within the Police District of Cowra.

I am not aware that there are any claims being worked within my division for minerals other than gold.

The only claims being worked for gold are situated at Wood's Flat, 12 miles distant from Cowra, and although there are few persons employed I have every reason to believe that a large quantity of gold in proportion to the number employed has been procured. There are now about twenty persons working on this field, and at present they say the prospects are very good.

This gold field was discovered and first worked in 1868, at which time there were about 500 people employed for a few months; after a little time they seemed to have lost the lead and only a few parties have been working from time to time.

Two persons (Paravicini and Peterson) who worked a small lease about two years netted over (I am credibly informed) £3,000.

About three years since two nuggets, weighing 65 ozs. and 50 odd ozs. respectively, were procured at a depth of about 54 feet, and as all those who have persevered in working this field have for the most part done well I have every reason to believe there is a good gold field here if properly developed. I would most respectfully suggest that Mr. Wilkinson, Government Geologist, be instructed to visit this gold field and carefully examine it, as I have a very strong opinion this is a most important place and capable of supporting a few hundred miners.

There are at present about twenty persons employed—about ten of those working two leases. It is difficult to find out how much gold they have procured as most of it has been sold in Carcoar.

Donald M'Donald and party state they have sold 160 ozs. of gold during year, and James M'Donald has sold 17 ozs.

Mr. Murray, storekeeper of Cowra, purchased 32 ozs. at an average of £3 16s. per oz., and Messrs. Austin Bros., 30 ozs. at an average of £3 16s., but, as I stated before, most of the gold has been sold in Carcoar.

I forward herewith a few forms, imperfectly filled up. I have found much difficulty in procuring information.

BATHURST DISTRICT—OBBERON DIVISION.

(Chas. W. Cunningham, Mining Registrar.)

THERE is but one gold claim at work in this division, the others are all abandoned, the reefs running out, and there is but one copper mine at work—Wiseman's Creek Copper Mining Co. The South Wiseman's Creek Copper Mine has been idle the whole year. The Wiseman's Creek Copper Mining Co. are commencing to erect smelting works at the mines at Wiseman's Creek.

Davies and Lambert's Mine.

THE mine has not been yielding any gold this year, they have been sinking a new shaft to cut the reef; the reef has been cut at 96 feet with not very good prospects.

Wiseman's Creek Copper Mining Company.

No defined walls to the lode,—country surrounding the ore deposit—talcose slate, and mountain limestone. Besides copper the ore contains lead, zinc, silver, and gold.

BATHURST DISTRICT—MITCHELL'S CREEK DIVISION.

(Samuel Shumack, Mining Registrar.)

MINING in general is not so prosperous at present, one of the richest claims has run out, but there are several new shafts sinking. Our greatest drawback here is the want of a large crushing plant as there is quartz everywhere. Plenty from 5 dwts. to 1 oz.; the poor quartz does not pay with our small crushing plant; consequently it remains unworked. It is certain all these masses of quartz will be crushed yet, and also it is believed by all experienced miners that they will well pay with large crushing power. The copper mines at Sunny Corner are at a standstill. It appears the ore that was taken to Lithgow or Bowenfels for smelting did not pay; it is however the opinion of some that they have not given it a fair trial yet. Alluvial mining and crushing are nearly at a standstill for want of water.

Winters and Morgan—Winterton Reef.

HAVE a large amount of pyrites but treated none. They also have a splendid lode of pyrites 3 feet thick. Assays from 5 ozs. 18 dwts. up to 20 ozs. 6 dwts. per ton; none treated.

TAMBAROORA AND TURON DISTRICT—SOFALA DIVISION.

(Hugh Bridson, Mining Registrar.)

I DO myself the honor to forward a short report of the Sofala Gold Fields, for the year 1876.

Many of the leases, applied for some years ago, have been cancelled, and very few retaken.

Ordinary claims have in some instances been taken up on some of the cancelled leases, and in some cases profitably worked.

The diggers in this district are dissatisfied at their prospects and are leaving with their families for other places.

The sluicing parties are all stopped for want of water in their races, and many parties of Chinese cannot work their river claims to an advantage from the same cause, as there is not sufficient water in the Turon River to drive their water wheels.

A company have taken up, under lease, 20 acres at Circus Point and 5 acres at Lucky Point, and have applied in conjunction therewith for a race to convey water from Bingle Tree, Upper Turon, to Circus Point, Lower Turon, a distance of nearly 20 miles, for the purpose of sluicing, and they are sanguine that when completed the speculation will repay them.

Most of the quartz-crushing machines are at a standstill for want of employment—some have been removed, some are to be, and others for sale.

The following miners' rights and business licenses have been issued by me during 1876:—Miners' rights 524, business licenses 19, and the gold sent by escort amounts to 6,535 ozs. 18 dwts. 11 grs., and by other means 517 ozs. 13 dwts. 20 grs., making in all 7,053 ozs. 12 dwts. 7 grs.

I enclose returns required by your Department, which have been obtained by the Warden's Bailiff, as it is impossible from my various duties that I can personally procure them, and the miners as a rule do not care about making returns of any kind. I have given and sent to most of the miners many of the returns to fill in; none have been returned. Sofala being included in the Tambaroora and Turon District, I presume the Warden (Mr. Sharpe) has made a full report of the whole.

The mines are at very low ebb, and the progress is slow. There are some few miners at Wattle Flat who are working as ordinary quartz claims some of the cancelled leases to an advantage. Most of the quartz claims at the Box Ridge and Quartz Ridge, down the Turon River, are at a standstill, and many miners are away shearing and reaping. It is to be hoped that mining generally will improve this year (1877).

TAMBAROORA AND TURON DISTRICT—STONY CREEK DIVISION.

(S. Landauer, Mining Registrar.)

I HAVE the honor to hand you herewith the several report forms filled up as near as I could arrive at the figures. As regards the progress of these gold fields I regret that the constant scarcity of water during the last twelve months proved most injurious to alluvial mining, besides reducing the number of alluvial miners by one-half; many of those remaining are very badly off; on the other hand the prospects of this field as a reefing country have considerably improved, especially near Stony Creek, where several of the reefs (abandoned as worthless) are yielding from £3 to £7 per week per man.

It remains a matter of great regret that at a time when plenty of capital was available for the development of these really valuable mines their management in almost every instance rendered success almost an impossibility; the yields recently obtained in Smith's claim, the Stringy Bark, and again in the Prince William, fully bear this out. Some time ago there was a hope the Bonada Reefs would be again in work before long; one of the original shareholders returned from Sydney to work a certain piece of ground that had been pointed out by some spiritualistic agency as extremely rich; unfortunately the spirits were at fault.

The cancellation of abandoned leases and the enforcement of the labour clause will no doubt prove a lasting benefit to the mining interest.

Poor Man's Reef Co.—Ironbark.

In consequence of a protracted dispute the mine has only been worked about three months by the present company.

MUDGEES DISTRICT—GULGONG AND HOME RULE DIVISIONS.

(Alfred F. H. Stephen, Mining Registrar.)

My report on the above divisions for the year ending 31 December, 1876, is, I regret to say, not encouraging, the amount of gold won and the number of miners' rights issued being not much more than half the quantity and number of the previous year; but I think, with a good many more, that 1877 will see a new start in mining matters, as owing chiefly to the visit of Mr. C. S. Wilkinson, the Government Geologist, and to the opinions expressed by him, miners are devoting more time and labour to the deep ground. Available capital is however wanting, as unfortunately the deep ground is very wet. The supposed Davie Buchanan Lead is still idle, for although gold was got by boring, and there is an immense area of most promising looking country, the water was found to be so heavy that since the prospectors were compelled to abandon their shaft the necessary combination of pluck and capital has not been forthcoming.

Whenever it is properly worked in the opinion of numbers of practical miners the owners will be largely remunerated, and a gold field capable of supporting some thousands will be opened once more at Home Rule.

The deep ground at the Black Lead is at present shut up, owing to the company at No. 44 having ceased working. From what I have heard, I should say that this ground some day will pay well.

A deep shaft is being sunk on the Star Lead; they are down about 170 feet, and are daily expecting to bottom.

On the Brown Snake, between Gulgong and Home Rule, a shaft was bottomed at (I believe) 152 feet, but without "wash." The sinking was most encouraging, as they went through a deposit similar to that found at the Black Lead, and containing fossils of a like nature. Mr. Wilkinson speaks very highly of this place, as it is a valley in which several of the old streams must have met.

With respect to collecting mining statistics, I delivered, personally, and posted a number of circulars and forms to the various lease and claim holders in these divisions, but, as I feared, with no good result. I have only received the filled-in forms from one lease and six claims. A great deal of valuable information is thus lost to the Colony, and miners have only themselves to blame if the official information respecting these divisions be very meagre.

The Nil Desperandum and Canadian Leads still produce the most gold, and are likely to last a considerable time, as a number of the claims have never yet been worked on the bottom, and also, owing to the great depth of the wash, which in some places is over 30 feet. In the old prospectors claim on the Canadian Lead, which is now lease 118, a very welcome nugget was found on the 27th November last, weighing 64 ozs. 3 dwts.

A good run of gold has been found in Lower Magpie Gully, and several claims are working now on gold.

In September there was a small rush to some new ground near Fraser's Lead, but it was found to be scarcely payable, and the prospectors have now abandoned their area.

A few claims have been getting good wages at Adam's Lead, the gold seeming to slope towards the deep ground at the now deserted Moonlight Lead. Two leases have been taken up lately between these two leads, and I understand work will commence very shortly.

On the Black Lead two or three parties are still working, but the runs of gold are so narrow that their labour is not very remunerative. Here too the various runs of gold appear to slope to the west, and when they meet in the deep ground, which is as yet untried, a great find may be the result.

During the year I have issued 749 miners' rights and 111 business licenses.

The amount of gold forwarded from Gulgong per escort, during 1876, was 18,446 ozs. 5 dwts. 17 grs.

MUDGEES DISTRICT—MUDGEES DIVISION.

(Francis S. Isaacs, Mining Registrar.)

In accordance with the request contained in your letter of 14th ultimo, I have the honor to report the following particulars touching matters connected with mining industry in the Mudgees Division of the Mudgees Mining District.

There are no metalliferous or mineral deposits which are being operated upon within my division.

Alluvial mining is mostly confined to private property, the Log Paddock being the principal scene of operations. I am informed that large quantities of dirt have been raised therefrom, averaging from 1 oz. to

1½ oz. to the load, and that some fossicking is carried on, but I can obtain no reliable information as to the yield.

On account of the increased drought in this district for the past twelve months, both alluvial and quartz workings have been greatly retarded, and mining is at present very dull. Some old and abandoned ground about 12 miles from Mudjee has lately been taken up, but no dirt has at present been raised.

I learn that no quartz mining is now being carried on in my division, with the exception of one company, viz., The British Lion, Leaning Oak, who are raising a small quantity of stone.

MUDJEE DISTRICT—HARGRAVES DIVISION.

(*W. M'Manamy, Mining Registrar.*)

Alluvial.

For the past year there is little change to note in alluvial mining in this division. The number of diggers is nearly the same as in 1875. A considerable quantity of gold is still obtained. The estimate, 5,219 ozs. 18 dwts. 21 grs., is believed to be under the actual yield. If there were means adopted to secure a reliable supply of water, there can be no doubt that this division could still support a large number of diggers. During the summer months no continuous work can be done for the want of water.

Quartz.

The general depression in mining affects this division. Of the numerous proved gold-bearing quartz reefs and veins in the division not one is now being worked. Those who have tried them assert that most of them are payable, but at present the working miner cannot obtain assistance to enable him to work for a time without an immediate return. It is admitted that the gold-bearing indications of the reefs in this division are the most inviting of any in the Colony.

MUDJEE DISTRICT—WELLINGTON DIVISION.

(*Fredk. Marsh, Mining Registrar.*)

I REGRET to state that, with the exception of the two mines, the returns from which are herewith enclosed, mining operations in this portion of the district are in a very depressed state at the present time, which I attribute in a great measure, if not entirely, to the extremely dry season which now prevails, and which has lasted for a very considerable time, the consequent want of water preventing operations, more particularly on alluvial workings. The mines referred to above, not being dependent on surface water, are not of course affected in a similar manner.

These two mines, each having its own crushing plant, are the only quartz reefs near Wellington which are being steadily developed. None of the quartz and mineral leases which were taken up during the mining mania some time ago are being worked. The general opinion, however, is that with the prospect of railway extension to Wellington at no distant period being an accomplished fact, inducement will then offer for the profitable investment of capital in many of the reefs in this district.

There has been a great deal of mining on alluvial ground in the past, but at the present time the scarcity of water is such that with the exception of an isolated digger here and there nothing of a character sufficient to report upon presents itself.

There is a party of about 16 or 18 Chinamen employed sluicing at what is called the Woolamin Junction, on the Macquarie River, about 8 or 9 miles above Wellington, but from their ignorance of the English language, and their well known aversion to giving information, it is utterly impossible to glean from them what has been the result of their operations. The gold has, however, I believe, been all sold in Wellington, and is accounted for in the returns kindly furnished to me by the managers of the Bank of New South Wales and Commercial Bank (the latter Bank having opened only within the last six months). I will endeavour, however, to get from them more particular and precise information, and if successful will forward same to you.

I am alive to the importance of the mineral resources of this auriferous district being fully made known, and am also sensible of the fact that the information given in this report is of a very general character; but it is my hope, and it is moreover the prevailing opinion, that with improved time and seasons such a stimulus will be given to the development of the gold fields around Wellington that they will bear favourable comparison with those in any other district.

LACHLAN DISTRICT—FORBES DIVISION.

(*F. S. Osborne, Mining Registrar.*)

Quartz Mining.

FORBES' Reef Gold Mining Company, at Oudgellioo Lake.—This Company commenced pumping the first week in September last; the water although rather strong is easily kept down; they do not look forward to any difficulty in this respect. The machinery, which is estimated to carry them down 600 feet at least (I allude to pumping and winding gear) works exceedingly well. They have raised some 300 tons of stone since commencing work this time; the stone shows gold pretty well, and they think of a better quality than in that obtained from the upper level.

I forward you under separate cover two samples of stone obtained from the main and cross lode. See "wrappers on each sample" at the 90-foot level.

The main shaft has been sunk about 60 feet below the lowest working, making 150 feet from surface.

The country gone through has been of a soft broken nature, but is getting harder and more settled the last few feet. The mine will be opened out at the last-mentioned depth in a few days.

Crushing was commenced on Friday last, the 15th January, 1877, so that they have not yet had a washing-up.

Nothing whatever has been done in alluvial mining at Cudgellico Lake Gold Field during the year 1876.

Strickland's Reef, near Forbes.—This mine is now held in reserve for six months to enable the shareholders to obtain machinery; they have had several small crushings during the year with an average of 1 oz. to the ton, but carting into Forbes a distance of 8 miles being so expensive they determined to erect machinery of their own on the ground where, by damming the gully adjacent to their claim, they can obtain a good supply of water for their machine.

On the Madman's Lead there are two quartz claims.—The first, "a lease," occupied by Schiller and another, who are endeavouring to find the vein or lode that was lost some years ago, and from which some very rich specimens were obtained. They are still sinking, but have not yet obtained anything payable.

The second is Rayner and another's claim, which is now in dispute. This claim adjoins Schiller and party's ground. Some rich specimens from this claim were sent by Mr. Warden Dalton to the Department of Mines in October last; they were obtained at a depth of 95 feet from the surface in a narrow vein about 2 inches in thickness; they are greatly troubled with water. I do not think they will succeed without machinery in going down any depth, as they will have to drain the whole of the flat, which would require powerful machinery.

There are several reefs in this division that would be worked, but the miners have been obliged to abandon them for want of water to carry on.

Alluvial Mining.

Mathieson's Lead, on the Bald Hills, near Forbes.—This lead was abandoned at the commencement of the year, but has since been taken up as extended claims in old and abandoned ground; there are now four claims of 5 acres each on this lead, two of which are amalgamated. The wash as it is raised from the shaft in these claims is thrown into a puddling machine erected close to the shaft, and having plenty of water, which they draw from the wellhole in their shaft, they are enabled to wash their dirt as it is raised to the surface without the expense of carting. They have been making on an average from £8 to £10 per man a week, and they consider they have from two to three years work. I believe that this lead will yet turn out well.

North Lead.—On this lead they are surfacing and are making wages.

Thorley's Lagoon, near Forbes.—There are six miners on this Lagoon, who are washing sludge from the old puddling machines, and are doing well, making good wages, and have some thousands of tons to work upon. They seem very well satisfied with their venture.

South Lead.—A party of eight men have taken up a claim on this lead and are now sinking, but I am afraid they will be greatly troubled with water, which is the great drawback to this lead; gold is known to be there, but they have never been able to overcome the water.

Rise and Shine Lead.—On this lead there are a few miners, but they are barely making wages, although they occasionally make a find of a good patch which pays them well.

Near Pinnacle Reef.—The miners at this place have been obliged, to abandon it, the water being exhausted, but intend to return at a more favourable season.

Remarks.—Mining in this division has been in a very depressed state during the last twelve months on account of the severe drought and the great scarcity of water, and no new discoveries can be made until we have heavy rains to replenish the dams and waterholes in the back country.

LACHLAN DISTRICT—M'GUIGAN'S SUBDIVISION.

(H. Margules, Mining Registrar.)

I HAVE the honor to submit my first annual report of the mining division under my charge.

To obviate repetition, I propose to include here what might have been interesting or valuable as statistics, new finds, &c., contained in my two quarterly reports, and thus do away with the latter altogether.

Also I feel it incumbent upon myself to advance a few notes on the geographical position and features as well as on the physical, geological, and lithological history of the land comprised in my division, which for the last four years has proved itself almost the principal contributor to the gold by escort to the Sydney Mint, and also a supplier of other private demands for the precious metal; hence it is entitled to be looked upon as the most important gold-field in this Colony at the present day. Its status thus makes it imperative to publish some details of its geography.

But I propose also to be brief, as much as it will appear compatible and consonant with the importance of the subject treated.

Geographical position.

The land constituting this division lies under 147° 30' to 148° 8' E. L., and 33° to 33° 7' S. L.

Where the gold workings exist at present the strip of land extends from 147° 40' to 147° 56' E. L., and from 33° to 33° 7' S. L., thus showing an auriferous tract of 12 by 8 miles or 96 square miles having been worked on at one time or another.

Geographical and Physical Features.

With the exception in the vicinity of Parkes, the Currajong and the Great Northern Lead, where more elevated ground meets the view, the country here consists uniformly of groups of gently sloping hills, inviting to the vigneron, while the far and wide undulating flats, plains, and valleys, would offer fine rewards to the husbandman—at present used by the pastoral tenant, and here and there occupied by the gold miner. Indeed there are very few valleys, flats, or plains without shafts and heaps of white, red, yellow, blue, or grey clays, slates, or other rocks. Some portions of the district afford to the eye as far as it may reach a sight of shafts sometimes ranging in line many abreast, sometimes straggling and at other times *en masse* without any regularity or order.

The mining population have established some hamlets or villages. The principal are: The Tichborne, on the south bank of the Goobang Creek, with a large population, possessing public-houses, stores, and so on. It had three branches of banking establishments, which were closed some few months ago. There is also a lock-up, police station, and a post office. The M'Guigan's and Lower M'Guigan's with a numerous population, several stores, churches, sawmill, Mining Registrar's office, and public school, are next in rank. Then follow the Welcome, Seymour's, and the London, severally, with adequate business places, according to the population.

The habitations of the working portion of the population are at times even as much scattered as their shafts and workings. At others they are crowded to the injury of health and comfort in masses of temporary abodes where the ground yields full supply of heaps of auriferous wash.

The land is watered by two creeks—the Goobang and Bartley's. The latter enters the district under 148° near the demarcation line of 149° E. and effects its confluence with the former within a distance of 5 or 6 miles at the point where the Goobang enters; thus both united under the name of the Goobang Creek pursue uninterruptedly a westerly course. These watercourses seem to constitute permanent streams, though the drought during the greater portion of last and this year continued almost unbroken.

The Goobang Creek in its course appears remarkably circuitous, in some places extremely narrow, though a matter of surprise by what force or violence it could have eroded its channel through the massive rock.

The banks of the Goobang Creek provide without doubt some picturesque scenery.

The surface features on a thorough inspection seem broken; the ridges, though of only gentle elevation, are rugged and irregular; the valleys narrow, numerous, and confined; the plains, especially the scrubby portions, of vast extent.

The soil shows every quality that the farmer, the squatter, or miner desire, being of a sallow brown colour.

Geological Features.

The sedimentary formations are here palaeozoic, metamorphic, or transmuted and tertiary.

I have since my appointment strenuously endeavoured to secure some fossil fauna and flora, and though personally I have in the limited time at my disposal obtained none, I have discovered that some have been sent from the Ben Nevis and M'Guigan's Leads to the Rev. W. B. Clarke, M.A., F.G.S., &c., for examination, which induced me to apply to the rev. gentleman on the subject, who, with his usual courtesy and ardour for geological data, gave the following rather important information, under date 7 December, 1876, to me:—"Only two fossils were sent to me—one a very small and imperfect brachiopod, apparently a rhynchonella; the other fragments of a crinoid; the latter from the Ben Nevis Lead. They were all in such a condition as to prevent determination."

I also had subsequently a few small pieces of bone from a shaft at a distance from the Ben Nevis. These were supposed to be "human," but they were nothing of the kind, and probably belonged to one of the marsupial creatures of the Quaternary epoch, if even in drift of 80 feet thick.

As Professor Hawkins, F.R.S., author of the valuable work on Caverns (Cave Hawkins) was leaving me for England I sent them on to him before he went. He replied on his way from San Francisco confirming my opinion.

I received one other specimen, but a piece of limestone, said to have come from below the shell.

The first two fossils and the limestone came from the extreme, as yet, explored depth of 204 feet in the claim of Messrs. Frampton and party, at the Ben Nevis Lead, and the marsupial remains were brought up from a depth of about 80 feet in a pleistocene drift of one of the shafts at the M'Guigan's Lead, second prospectors' claim.

The principal characteristics in rocks here are the varieties and mixtures found together, the sandstone, the porphyry, the greenstone trap, the cement and the various slates or schists.

MINES AND WORKINGS.

Alluvial.

Our alluvial leads and their branches seem to be of auriferous origin, though the varieties of the mineral components met with in the sinking or in the wash are very noteworthy, but still in every instance, except the portion of the Ben Nevis, to be dealt with hereunder, whether shallow at 9 feet of the Frenchman's Lead, or deep at 157 feet of the M'Guigan's South, or 120 feet of the Welcome Leads, a pleistocene clay covers the auriferous drift.

The transmuted slates, iron pyrites, blendes, asbestos, porphyritic boulders and clinkers, warrant the existence of auriferous metal beneath the underlying drift of the pleistocene. The Rev. W. B. Clarke, in his "Remarks on the Sedimentary Formation of New South Wales, 2nd June, 1876" states thus: "Some slates have apparently been changed into granitic rock"; also, "gold exists almost in every distinctive rock of New South Wales"; and further, "much of the gold in New South Wales is derived from iron pyrites in granite and in

beds of sedimentary origin, consisting of silicious matter, cemented by iron derived from decomposed pyrites, whilst it has been shown by Aplin, Daintree, Hackett, Wilkinson, and others, that much gold in Victoria and Queensland is due to the intrusive agency of felsites, elvanites, and diorites. The dykes or reefs of quartz in the silurians are therefore not, as once supposed, the exclusive sources of the Australian gold; nay, there is good reason to believe that the carboniferous rocks are themselves impregnated, as in one remarkable instance on the Peak Downs. In New Zealand gold sometimes occurs so mixed with silicious particles as to constitute with them a golden sandstone."

The leads, I nearly omitted to state, are the veritable valleys, gullies, or flats, which were the ancient receptacles of the waters by inundations or floods, and of course the depositories of all drift matter. The depths of these channels are determined by the distance of the elevated ground or hill, from which they have originated and taken their fall, thus increasing in depth with the increasing distance from the drift supplying hills, sometimes from a few inches, or from the surface to hundreds of feet.

In the course of sinking for and in raising wash, quartzites, clinkers, and boulders are met with. These masses in the drifts are scattered far and wide without regard to stratification. We come on these masses at various depths and in various positions. The combination is not always the same; it showed itself in the simple white and red clays, as clinker at the M'Guigan's Lead, as well as in the more complicated composition of Tichborne, Wapping Butcher, and other leads. At the M'Guigan's Lead the clinker is simply a consolidated mass of the white and red clay, and is found 20 feet before reaching the bed of the wash. The clinkers at the Ben Nevis, Wapping Butcher, and Tichborne Leads are crystallized, some exquisitely shaped, especially at the Tichborne Lead, vying with the Meissen porcelain works. The largest piece of a clinker at the Wapping Butcher was 9 feet high. At the Wapping Butcher and Tichborne Leads these bodies contain gold *in situ*. From one weighing 3 lbs. 3 ozs. of gold were obtained; from another, 1½ oz. and so on. They are inside pure white, with rarely very slight external colouring, the latter from contact with ferruginous matter, and are found at the Wapping Butcher and the Tichborne Leads amongst the wash, sometimes lying on the bed rock; but at the Ben Nevis, 40 feet in the pleiocene clays above the auriferous wash, and the bed rock mostly in a perpendicular position. These crystallized clinkers prove most indurate, defying the pick and the gad.

The presence of great quantities of magnetites, hematites, and sulphurets have produced veins of cement containing gold *in situ*. I shall forward sample No. 1, taken from the heap of Messrs. Murphy and party, from the Wapping Butcher Lead. The oxidation shows on the sample the long exposure to the air. The same owners took on the 10th October, 1876, from two patches about half a bagful of cement, which was pested, and brought 150 ozs. of gold; that party also crushed 200 tons of same cement at the Welcome Machine, realizing 379 ozs. 15 cwt. 2 grs. Messrs. Barlow's, of same lead, crushed at same machine 32 tons of cement, with a result of 84 ozs. The London lead cement realized about 17 dwts. to the ton. Paddy's Flat conglomerate realized 7 dwts. to the ton. I shall also forward another sample of cement No. 2, taken from a depth of 154 feet at No. 8 of M'Guigan's South, below Snow and party. This conglomerate contains gold *in situ*. A piece of it from No. 7 had taken from it, when broken up, one solid piece of gold weighing 1 oz. There seems to exist a vein of about 2 inches wide at this locality.

The pebbles, quartzites, etc., are here in color—red, brown, green, white, steel color, orange, pink, yellow, etc.; in shape short, elongated, rhomboidal, round, stout, lamellar, thin and flat, oblique, conchoidal, oval, indeed of nondescript varieties, shape, sizes, and colors, and of weight from a few grains to several pounds.

In order to proceed with the details of the various leads, I shall take the starting point at the M'Guigan's Lead, where the plan of that Lead in "Mines and Mineral Statistics of New South Wales," shows a depth of 76 feet on the lead.

Having given these necessary preliminaries, I shall now give concise and short descriptions of the various leads, and deal with them as the subject will permit.

The Ben Nevis, London, Little Wonder, Victoria, Sydney Clinker, and All Nations Leads.

3 miles north from M'Guigan's Lead lies the Ben Nevis Lead at the foot of what seems a very slight range in a thickly-timbered valley of great extent, confined and narrow at the head, but widened out at the base. By several shafts sunk it was ascertained that the ground has sudden descents from 25 feet to 120 feet in less than half a mile; then again it ascends as suddenly to less than 100 feet, and so on, within a very short distance, while a belt of older amygdaloidal basalt, called by the miners "tertiary bottom," crosses the lead from north to south, the Ben Nevis's run of gold being south-east to north-west. The older sedimentary formation, now proved to be under the middle paleozoic epoch by the Rev. W. B. Clarke, in his classification of the fossils found here, had been followed down by Messrs. Frampton and party to a total depth of 204 feet, 117 feet with the older clays. These immense masses of clay are of a yellowish cast, thickly impregnated with small and minute crystals, also showing occasional layers of drift matter, such as gravels, quartzites, sand, sandstone boulders, and other debris, while repeated auriferous wash deposits were the rule rather than the exception, the gold being very scanty, fine, and not in paying quantities. The ground is known as No. 2 North, and was taken up by Messrs. Frampton and party in April, 1875, after being abandoned by the original shareholders. The party named prospected the ground for over six months, and deserted it again; it lies now idle. In their search the party, after a depth as already stated of 204 feet, came on 6 inches of white, fine sand, amongst which they unearthed a small shell of clear white colour, and a bone, which they transmitted sometime in October, 1875, to the Rev. W. B. Clarke, for analysis. These miners touched below the white sand an indurated limestone, defying any attempt at removal by means of the ordinary alluvial mining tools, while its contact would fill the air with gases of almost unbearable odours. There, too, the party detected some auriferous drift, but not enough to pay. Still the rock was dipping, and as Mr. Frampton says:—"20 feet more might have proved the ground, but the patience of the party was completely exhausted."

Most of these details were kindly furnished to me by Messrs. D. Frampton and James Hewitt.

It is to be regretted that that or some other party of miners did not prosecute the search a step further and prove the ground, as there was evidence enough that this locality only had given the so long doubted indications by the white sand, fossil, and shell, of the discovery of a deep river, a permanent watercourse, the main channel and drainage of rather extensive tracts of the country round, and thus justifies the assumption that the deepest portion of the bed may contain some heavy auriferous drifts.

Should a test be contemplated by a Co-operative Company—a body best adapted to undertake such work—I should suggest occupying the land under lease, because the depth, proved already, will reach very near, if not over, 250 feet.

The Ben Nevis Lead was first opened in March, 1874, and was for a short time occupied for 2 miles, but was soon after deserted.

During the present year six parties of four miners were in fair paying employment. They raised 3,719 loads, with a yield from 4 to 7 dwts. to the load. The dirt raised is from a depth from 80 to 120 feet, the bottom being slate. The gold in this and the London Lead differs in appearance from that of other leads.

Half-a-mile south from the Ben Nevis, amongst a densely scrubby surface, along gently rising ground with numerous interruptions, the shafts of the London Lead are situated. The sinking here is from 35 to 140 feet; the run proves to be south-east to north-west. The lead was opened in April, 1874, by No. 12 striking payable prospects at 42 feet, and the supposed run was occupied for a distance of over 2 miles. Only the central claims paid—that is, the ground from Nos. 14 to 19; the latter has given out a greater quantity of dirt than any other claim in the Division. From No. 20 the ground showed suddenly a precipitous decline from 80 feet to 140 feet, and proved almost barren of gold, but plenty of wash, though gold was found scattered during the sinking—never in quantities to pay for the working.

Mr. Wilkinson, while commenting on Mr. Warden Dalton's Report of 1874 on the same subject (the deeper ground not being auriferous), says, in his "Notes on the Geological and Mineralogical Collection at the Metropolitan Intercolonial Exhibition, 1875": "Such not uncommon occurrences may have originated in various ways; for instance, at the particular time of the deposition of the gold-bearing drifts the old stream may have been wearing away, and distributing as drift some auriferous bed rock or quartz reef, which had no great depth, consequently when the river had eroded its channel to a lower level, the underlying rock it then acted upon may have been not auriferous, and therefore the drift derived therefrom would be so also. Again, in silurian country there have been frequently noticed belts of non-productive rock, running parallel and alternating with rich tracts; these then, under certain circumstances, would also afford an explanation upon the abovementioned facts." I also had the honor, when mentioning these facts first, to comment upon them as follows:—Ancient watercourses, the receptacles especially of flood waters and drifts, in their formation may have been shallow at the point of commencement, running thus for a short distance, but taking suddenly a considerable decline alike the watercourses, called blind gullies of the present day, one of which I may point out at Little Plain, near Jerrawa Creek, where the channel for flood water commences with a few feet, but after a distance of a few hundred yards abruptly takes a perpendicular descent of over 100 feet. The auriferous drift, it is assumable, would easily lodge itself in the shallow portion of the channel, while the high banks of the deep portions would absorb most of the lodgments; thus it appears the succeeding sedimentary formations covered the shallower lying drift intact and compactly, while subsequent formations, drifts and so on, would only sweep the banks of the deep portion and thus mix the deposits of the banks with those of their own masses of sands, clays, and debris. These leads therefore are found payable and even richly auriferous in their more shallow gradually regulated portions, while from the point of the precipitous decline the gold is found scattered through the clays and gravels met with during the sinking, as much as in the wash of the bed."

Miners certainly ought to pay attention to these phenomena, persuaded that the deepest ground not always holds the heaviest gold deposits. Gold being heaviest is retained, as is well known, by the slightest obstacle. Mr. Wilkinson earns undoubtedly great commendation for his so lucid exposition of that vexed subject, and may save to men many hardships and privations in their perseverance during the search for gold.

At this lead there have been still about 12 claims of four miners employed during the past 12 months, and gave out 13,595 loads of dirt, yielding from 3 dwts. to over 1 oz. per load. The cement at this lead yields about 17 dwts. to the ton. The bottom at most of the claims is pipe-clay and slate.

The Little Wonder, on the eastern branch of the last-named lead, runs into it at No. 14, and was of short duration in its circuitous course. At the early part of the year it still contributed to the work of the puddler, but at present it is completely deserted.

About the month of August last some shallower ground at No. 20 on the London Lead was traced westwards at a depth of about 82 feet, to the left of the shaft 150 feet deep—the wash seemed lodged on a plateau, like bed consisting of slate; a great rush then set in, but after a few days, with the exception of one claim, the ground was deserted again as unprofitable.

In the same direction as the London lie the Victoria, Sydney Clinker, and the All Nations Leads, prospected shortly after the opening up of the London Lead; they never proved of any consequence. At present these leads are completely deserted, with the exception of the Victoria Lead where still about ten miners are fossicking. During a portion of the present year about 1,000 loads came from the Victoria Lead and but few loads from the All Nations Lead. When passing these leads on my tour I observed on some heaps argillaceous limestone, but on ground where no gold was traced.

Most of the ground producing auriferous drifts does not differ in sedimentary formation but invariably show beneath pleocene red, yellow, and grey clays, the drift resting on a bed of either chloritic, talcose, or argillaceous slates.

The Welcome Lead and its branches (Terrace, Paddy's Flat, Frenchman's, Little Welcome, New Welcome, Nibbler's, Growler's, Fulton's, Richardson's, and Well-ried).

THE Main Welcome has its position $2\frac{1}{2}$ miles east from here. The lead seems to have assumed a form very much indeed like a trunk of a tree with its numerous branches, sub-branches, forkings, and roots. The deepest channel hence is constituting the main lead or trunk with a depth of 140 feet, and runs to some extent, while the branches are shallower and of shorter extent. The ridge flanking the lead, a continuous but not very irregular hill, crosses the Goobang Creek, stretching its south-eastern course over the Scrubby Plains.

The lead was first discovered in 1872; then followed the Terrace in 1873 (also called Tear-away), so named from its natural surface formation being a natural terrace. This lead lies 1 mile north-west from the Welcome trunk, was once supposed to be the head of the main lead; hence the quartz reef near it is called Welcome Reef, but no junction was ever traced. The Terrace is famous for nuggets. In 1874 it produced several heavy pieces of gold respectively weighing 7 ozs., 25 ozs., 35 ozs., 37 ozs., and so on to one of 134 ozs., and during the present year it contributed to its old stock a few more nuggets weighing from $1\frac{1}{2}$ oz. to 30 ozs., and even lately one of 12 ounces. During the month of March last, having been deserted for some months, this branch was reoccupied; the depth is about 26 feet. Messrs. Wilson and party have washed lately and realised from 20 loads 24 ounces, amongst which they had the already mentioned 12 oz. nugget. There are now eight claims fully at work on payable gold.

On the flat extending from the Terrace westward are numbers of short runs named Paddy's Flat. At the eastern portion a new run was traced a few months ago, supposed to be a continuation of the Terrace gold but virtually proved to be the outside flankings of Paddy's Flat; the sinking was about 80 feet. Several parties tried their luck there but with little success; one claim however is still at work there.

Some short distance north-west are the few claims of the small run called Little Welcome.

Still more westward on the same flat is the Frenchman's; shallow patches had yielded rather large amounts of gold and still continues to supply some quantities of dirt with but poor yields; the depth is from 9 to 14 feet. This portion of the field is rushed very often and of course as often deserted.

From the lower portion of the Main Welcome the New Welcome is branching off, opened in December, 1875. It gave out a great amount of poor dirt but appears nearly deserted now.

With a slight southerly bend from the New Welcome on the southern bank of the Goobang Creek is Fulton's; it produced some few hundred loads of dirt during the present year and 11 nuggets weighing from 1 to 3 ounces in gold; it is now idle.

On the north-westerly slopes were discovered at short distances the Nibbler's, Growler's, Richardson's, and Well-ried gullies, once very remunerative workings with various yields, and the fossicker still finds a genial home there.

There exists little if any difference in the formations: the bottom shows the chlorite slate, the intrusive masses are mostly hornblendic.

The miners in these localities produced, during the present year, 18,741 loads of dirt yielding from 2 dwts. to 1 oz. 4 dwts. to the load.

M'Guigan's, M'Guigan's South, Randall's, and M'Grath Leads.

The M'Guigan's Lead played the most important part in the success of the Billabong Gold Fields. After the failure of tracing to any extent the Great Northern Lead—miners made off to the then greatly prized Palmer Gold Field, in the Colony of Queensland, and the population in general frittered away to not much over 500 souls during the month of February, 1874. This state of things was not to last long, and on the 8th March, 1874, M'Guigan and party obtained good prospects in their shaft of 45 feet deep. The report spread as wildfire. The deserters not only returned but brought in their wake thousands of new men; and in fact within three months after that discovery the district had a population of very nearly 10,000 souls. The town of Parkes filled with new arrivals, amongst whom were men of business, energy, and enterprise—soon laid aside the rugged appearance of a struggling mining village, and its sham buildings assumed the style, structure, and outward show of a settled and populous town of some extent and importance. Soon after the opening of the M'Guigan's Lead, the London, Ben Nevis, Well Tried, Sydney Clinker, All Nations, Growler's, Tichborne, and Wapping Butcher Leads were brought into note.

The ridge flanking this lead extends from north-west to south-east to a considerable distance beyond the southern bank of the Goobang Creek, which had eroded its course through both ridges—the Welcome and the M'Guigan's. The lead, as a gold discovery, proved also the most important in this district, and gave with few exceptions a generally good average supply of dirt, afforded fair and even rich yields; in fact, proved the most compact and well-defined lead in the whole of the Billabong Gold Field.

Its extent was over 2 miles, its depth from 45 feet to 157 feet, and the yield from 3 dwts. to as many ounces per load. The tracing in "Mines and Mineral Statistics" represents its shape, commencing forklike, then forming an elbow, and showing its run to take a considerable distance and to be mostly regular, being narrow at the head and widening out when becoming deeper. The shallower portions proved the richest.

The prospecting claims produced the following results:—

		ozs.	dwts.	grs.	£	s.	d.
1. M'Guigan's.....	3,567 loads; average yield 12 dwts. ...	2,140	4	0	8,025	18	0
2. M'Gee's	1,372 " " " 17½ " ...	1,209	11	19	4,535	17	9
3. Cook	3,250 " " " 12 " ...	1,950	0	0	6,312	10	0

The expenses attached, which could not be less than 10s. per load, of course must be deducted from the above totals. Besides these claims, others have given out great quantities of wash too and permitted shareholders to clear from £500 to £1,000 each.

During the month of January last most of the ground was still in original hands, but it has gradually changed into extended claim; still some of the ground appears yet to possess exceptional value, since it will be the cause of litigation in a jumping case near No. 2 south of Cook and party.

The lead is remarkable for its chlorite schists and its hornblende intrusive quartz. The green quartz is much fissured and contains gold. Mr. P. Maloney panned a piece of 10lbs. weight and obtained 3 grains, also from a piece of 1lb weight 12 grains of gold.

The South M'Guigan's Lead is simply an unbroken continuation of the northern run beneath the bed of the Goobang Creek, still occupied in some portions as extended claims.

Eastward from the head of M'Guigan's Lead Messrs. Randall and party obtained some prospects at a depth of 47 feet on 22nd June last, but though surrounded by shafts and expeditiously driven some distance in every direction possible, nothing was found to justify the working of it.

Easterly too, branching off into shallower ground from the third prospectors of the M'Guigan's Lead, the M'Grath Lead in April last had its start, but though many parties spent some months and even raised some few loads of dirt, the result showed no encouragement and the place is deserted now, except M'Grath's claim.

During the past year this portion of the division gave 7,656 loads, yielding from 3 dwts. to over 18 dwts. to the load.

The Great Northern Lead.

On the south bank of the Goobang Creek, 2 miles east from the Welcome Lead, the Great Northern Lead had its start, and crosses the Goobang Creek there. Its depth is over 100 feet on the southern portion, with which this report deals only. The water of the creek filters into the deeper lying ground, and makes the working there rather precarious and difficult. Some new ground was prospected near that lead in January last, but on account of its great depth and volumes of water swamping the shafts the prospectors desisted. Since then on my visits to that locality I found the ground and even the prospectors' shaft fenced in, being under application for conditional purchase by a person named T. W. Kelly.

The ridges and ranges around that locality possess greater altitude, are more marked and distinguishable, and the gulleys and valleys seem there more defined.

During the past year 2,710 loads were puddled with a yield of 2 to 10 dwts. to the load.

The Fairy, Tichborne, and Wapping Butcher Leads.

Tom's Knoll, better known under the name of Miller's Hill, forms a prominent part, in either constituting the source of or the obstruction to the extent of the spread of the gold deposits in its vicinity. Upon the hill itself gold was found, but stopped short altogether towards the south; and short as the distance of the gold deposit in the northern direction was it proved intricate to trace or connect. The ridge appears to be nothing else but an immense mass of porphyry and quartz of divers compounds, showing vast mineral and metallic admixtures.

The Fairy Lead in descending has its shallower and heavier gold deposit overlaid by about 15 feet of very fine red sand, after passing the pleiocene clay. The deeper run was not regarded as payable there. The run of heavier deposits enters the Tichborne Lead, while the Wapping Butcher Lead falls into it, thus forming a right angle. Hence from east to west the Tichborne takes its segregated course at No. 4, and the Wapping Butcher gradually approaches from the north and completes the angle. These leads retain their regular course for a limited distance only, thus the Tichborne within a mile turns half round and runs due south, while the Wapping Butcher turns due west, and in their deviating course the precious metal becomes extinct.

Where "greenstone" is, though gold becomes already scarce before reaching that spot, the ground around that locality is crowded with many varieties of mineral and metalliferous species, but especially in abundance are the feriferous ores, embracing the pisolic limonite and the massive goethite, of which I picked up there very fair samples, also some light cement. Oxides and pyrites are also in abundance. To judge from the decomposition of the rocks, and the peculiar rotten and disintegrated appearance, with the abundance of sulphurets of iron, now mostly in a state of oxidation, would lead to the belief that some veins of iron ore may be successfully looked for there.

The Tichborne Lead is the nearest to the M'Guigan's, being about 1½ mile distant in a direct line eastwards.

The three leads have their position on the southern portion towards the Goobang Creek, and have been worked since November, 1874.

The depth of the Tichborne Lead has been proved to be from 70 to 140 feet, the widest portion being 100 feet, the depth of wash from 2 to 17 feet, the yield of wash from 3 dwts. to 1½ oz. There were some good dividends. The Frenchman's block, off Pyke and party's prospecting claim, had 17 feet wash, and over 5,000 loads realized £5,000 to four shareholders; likewise No. 6, Mooney and party, had £900 per man, while D. Maher and party, and others, may be mentioned as showing the richness of portion of the Tichborne Lead.

The lead contained quantities of quartzites of liver colour, as well as hornblende rocks. The bed rock seemed mostly talcose and chlorite slates.

During the twelve months just ending the lead contributed 10,530 loads—the expenses of raising, &c., &c., of, which was from 10s. to 12s. per load.

From Nos. 5 and 6, east of Murray and party's prospecting claim, on the Tichborne Lead, a branch seems to be southwards from the extended ordinary block claims of Oxenham and party. The dirt realized about 9 dwts. to the load, from 35 loads. The ground in advance has been re-occupied for some distance.

The Wapping Butcher Lead, from 45 to 70 feet in depth, about 1 mile in extent, contained wash from 1 foot to 16 feet—in some places about 200 feet wide; some of the wash dirt was very rich, yielding as high as 6 ozs. to the load (in Bawes and party's claim). Several claims were even fairly payable on the western line for a distance of over $\frac{1}{2}$ of a mile, but the richest of the claims are on the run from north to south. Thus we find Carroll and party, with 1,200 loads, yielding 1,600 ozs., amongst which were many nuggets from 2 dwts. up to 18 ozs., several 5 and 7 ozs. in weight. Farrell and party, 2,200 loads, with a yield of 1,543 ozs., many nuggets mostly weighing 5 and 6 ozs., the largest 16 ozs. 10 dwts. Messrs. Barlow and party, 600 loads, 450 ozs., and from cement 84 ozs., making 534 ozs. in all. Messrs. Jones and party have already washed 1,306 loads, yielding 2,912 ozs. 12 dwts. 2 grs.; had several nuggets of various weights. This party has about 1,000 loads to grass waiting for water to puddle, and it is expected this will complete the proceeds from the claims, bringing up the proceeds, since its opening up in November, 1874, to over £20,000. Messrs. Murphy and party had a large amount of dirt, some yielding 3 ozs. to the load; also cement, with fine results, and nuggets up to 20 ozs. The sinking in that claim was as follows:—

	ft.	in.
The fallow brown soil	5	0
Sand and drift	5	0
Friable red clay	30	0
Coarse gravels	2	0
Chocolate-coloured friable clay	10	0
Conglomerate	3	0
Total.....	55	0

It will be seen that the Wapping Butcher Lead proved a nest of nuggets from $\frac{1}{2}$ dwt. to 20 ozs., many weighing from 1 to 7 ozs.

The cement in some lots crushed as high as 2 ozs. 10 dwts. to the ton.

The Fairy Lead was comparatively shallow, the greatest depth being 45 feet and paid well. In Harrison's the red fine sand gave some little trouble to the party, but when blocked and fitted by substantial good timber the ground was easily worked, the gold showing freely in a rather narrow channel. The same may be said of Bruce's, now under application for lease by Pyke, already abandoned by Dickson and party.

Harrison's claim yielded 695 ozs. to 1,400 loads; amongst the gold was the nugget now at the Museum of the Department of Mines, weighing 19 ozs. 12 dwts. Barnett and party had 1,070 ozs. to 1,390 loads, showing several specimens, one weighing 16 ozs.

The number of loads puddled during the last 12 months were 10,609 for the two leads. The expenses per load of raising, &c., &c., was from 10s. to 12s.

The bed consists of chlorite slate, talcose, schists, and granites. There are great quantities of cement, quartz boulders, and clinkers amongst the wash containing gold.

In collecting the information on these leads I feel an obligation to express my acknowledgment for the very useful information afforded to me by Messrs. McLeod, Liston, Harrison, and R. Smith, without whose aid, so courteously and zealously given, I could not have succeeded in mastering all the details in the limited time allowed to prepare a report. And I shall also mention, in broad contrast, the obstructive manner of some persons, who make it a practice to suppress all information, or otherwise advance unreliable and quite misleading data.

Messrs. R. Smith, Rees, and others prospected some portion of the ground between M'Guigan's South and the Tichborne Leads, obtained very encouraging prospects, but the wash raised was deficient in the necessary quantity of gold necessary for it to be worth working.

Bartley's Creek Field.

Two different parties spent some months in this locality, but without any success.

The Scrubby Plains.

Three miles south-east from the Tichborne lead a party of six miners (Dunlope and others) in March last reported payable gold at 135 feet deep, but when trying a machine of dirt they found it unprofitable, and thus abandoned the place.

For two months Messrs. Duke and party devoted their time to test the portion of the Plain, taking its fall from the Welcome ridge, about $1\frac{1}{2}$ mile from M'Guigan's Lead southwards, $1\frac{1}{2}$ mile from the southern bank of the Goobang Creek, and not far from the reef prospected some time ago by Cotton and party. Messrs. Duke and party put down a great number of shafts to various depths, from 10 feet to 40 feet, from 60 to 82, 83, and 95 feet, in a line, in order to ascertain the distance from reef to reef; then they drove 140 feet, found plenty of wash, obtained some fine gold—once a rough prospect—but the ground did not prove payable. None of the hundreds of miners who were shepherding attempted to sink, and these energetic prospectors being homed in by the pegs denoting block claims, had no other option but to leave the ground altogether. Had the ground there been held under the frontage system the width allowed by it constituting some security to miners for work expended, many shafts below and above Prospectors would have gone down, and thus the locality would have received a proper test. I may, as an instance, point to the Tichborne Lead, which, had it not been held under the frontage system, would certainly never have been opened. It is a well-known fact that Messrs. Murray and party, the first and virtual prospectors of the Tichborne Lead, never obtained payable dirt, and had no

reward whatsoever for their immense time and labour expended, and were ultimately compelled to leave their claim as unprofitable; but the ground being held under the frontage system while Murray and party could obtain nothing of a payable nature, the adjoining claimholders, east and west, commenced a thorough test in advance, and thus traced and proved not only the Tichborne Lead but also the Fairy and Wapping Butcher Leads.

It is impossible to lose sight of the fact that some of the deeper eroded portions of the channels in this district do not contain gold in payable quantities, and the ground, tried by Messrs. Duke and party, forms no exception to this rule. There were some rough prospects obtained at 95 feet deep, and there was plenty of wash, and everything looked encouraging enough; the conclusion therefore may be reasonably drawn, that the shallower ground might contain paying deposits, and another trial should be made more south-east—about half a mile—from the line of shafts put down by the late prospectors. Of course the excitement caused by the Urana rush has taken hold of our population; hence there is no likelihood that this locality will receive another trial at present; but it is as well to draw the attention of miners to the place.

GOLD produced from various Leads.

	Number of Loads	Total of Gold.	Average yield per Load.	Depth of Workings
		ozs. dwts. grs.	ozs. dwts. grs.	
London Lead, &c.....	13,595	4,078 10 0	0 6 0	35 to 82 feet
Ben Nevis	3,719	743 16 0	0 4 0	80 „ 120 „
Victoria	1,000	200 0 0	0 4 0	— „ 27 „
M'Guigan's, &c.	7,656	1,914 0 0	0 5 0	42 „ 154 „
Welcome and all its branches.....	18,741	3,748 4 0	0 4 0	9 „ 140 „
Great Northern.....	2,710	406 10 0	0 3 0	— „ 120 „
Tichborne	10,530	3,685 10 0	0 7 0	70 „ 90 „
Wapping Butcher.....	10,609	7,956 15 0	0 15 0	42 „ 70 „
Scrubby Plains	27	2 7 12	1 18 22	— „ 135 „
Total	68,587	22,735 12 12		

Tallings passed through the Welcome steam-machine, Wapping Butcher		ozs. dwts. grs.
Lead, Murphy and party, 30 tons at 11 dwts.....		16 10 0
Do. do. 14 „ „ 20 „		14 0 0
Total		30 10 0
Cement crushed at the Welcome steam-machine:—		
200 tons, Paddy's Flat, 7 dwts. per ton		70 0 0
32 „ Wapping Butcher, Barlow		84 0 0
200 „ do. do., Murphy and party		379 15 2
‡ bag, broken up by Murphy and party		150 0 0
Total		683 15 2

Waste.

Clearings of puddling-machines, pebbles, quartzites, &c., are treated by the ordinary cradle; the heaps are first sifted, and the fine stuff brought to water and there cradled.

At M'Guigan's—

Metcalf and O'Shannessy's heaps bought for £5 by Pratt and party, realized within five months, for the three partners (20 loads per week)..... 80 ozs.

At the Welcome—

Shaw's heaps—from these the two brothers Longford—lads—make from 30s. to £3 15s. each per week 20 „
At other machines at the Welcome, &c. 40 „

Total..... 140 ozs.

Sludge.

		Accumulated tons.	Accumulating tons @ week.
<i>At the Welcome Lead—</i>			
At various machines		320000	.....
Only Bray and Tyers at present working .....		.....	200
(Samples forwarded, 10 lbs. from Shaw's.)			
<i>At the London and Ben Nevis Leads—</i>			
At the machines of the three owners		18000	300
(Sample forwarded, 10 lbs. from Mobbs'.)			
<i>At the M'Guigan's Lead—</i>			
At the various machines		31000	.....
Only two owners puddling at present; 6 machines employed; the others idle for want of water .....		.....	400
(Sample forwarded, 10 lbs. from Everett's.)			
Total.....		369000	900

In closing this portion of the report I shall also mention that pleiocene chocolate-coloured clays are very remarkable in this district, especially at the Frenchman's, Well Tried, M'Guigan's, and Wapping Butcher Leads. These clays invariably are met with before touching the auriferous wash; in fact resting on such wash.

Quartz Reefs.

In 1862, as well as 1872, the Billabong Gold Field gave some considerable evidence of the existence of rich quartz reefs within its boundaries, completely surpassing its alluvial gold products, but in each decade quartz workings were of short duration only.

The mining and "floating" mania was at its acme in 1872 in respect to reefs, and enticed men to invest in such mines, but unfortunately in the form of company's scrip. The companies so formed failed to provide a working capital, which led to the unavoidable consequences of a break-down, that is, that when the reticulated leaders (Trümmerstöcke) disappeared, or lodes became faulty, pinched in, or "took a horse," no funds existed for the prosecution of the necessary works for the following up and the tracing of leaders and lost veins; hence the total abandonment of the ground as if completely valueless, while the scrip became so much waste paper, and the companies failed. These effects were also felt throughout the districts, not only by loss of population and of the production of gold, but also by such extensive areas lying idle, because almost all ground held by companies was under lease, and parties anxious to work them (some are now taken up and profitably worked) could not venture upon them until the respective leases were cancelled by Government.

The prosecution of quartz reefing is at any time a difficult task: leaders are not easily traced, and lodes are difficult to be picked up again when lost. The tortuous and whimsical run of an alluvial lead presents enough obstacles to the miner to contend with when seeking for a new discovery, or trying to pick up a lost or faulty lead, but such difficulties appear smooth and plain indeed when compared with those to be met with during the explorations of quartz regions. There is no wonder then that companies having no capital failed.

Mr. Wilkinson, in his letter of the 22nd August, 1876, very aptly remarks thus:—"With but few exceptions I have noticed that on all the gold fields recently examined, hornblende granites and intrusive greenstone or diorite are the original source, whence the gold found in the alluvial deposits has been derived. At Grenfell this is very marked. There we have a very large mass of porphyrite intruding upper silurian schists. Quartz reefs, varying in thickness from that of a mere thread to over 10 feet traverse the intrusive rock in a north-easterly direction, and in some instances pass into the adjoining schists; but though richly auriferous while in the former rocks they cease to be so immediately on entering the schists."

I thus hold with all established authorities on that subject, that all well-defined lodes are the creation of electro-chemical forces, acting upon the surrounding minerals and metallic substances when in a state of chemical solution in the adjacent rocks, actually erecting and otherwise thus filling in fissures. Of course these fissures, with their contents were, are, and will be the veritable veins or lodes which we have to test; and we have found them and shall find them in every instance to contain the metal we seek, to a depth only to which the surrounding and adjacent rocks by their nature would warrant a supply. In the case of gold especially, the thus locally-formed quartz will be found on trial to contain the precious metal, when the adjacent rocks could supply the necessary particles, so locally collected and attracted by an electro-chemical current.

Therefore it is important for the miner, in prosecuting the search for a vein or lode, lost either by "pinching in" or a "jump," or without a trace of either walls, or even following up a leader, to examine the formation he meets with either in driving or sinking, and to direct his work according to the favourable or unfavourable nature of the rocks. As regards gold, Mr. Wilkinson especially draws the attention of the miner to the "intrusive masses of granite and greenstone or diorite."

Since the unremitting perseverance of the Department for Mines removed lately the restrictions and bar (having had their existence here from the cause already stated of idle lease-tracts held by defunct companies), and by numerous cancellations re-opened the ground for occupation and working to the individual miner, the fruit of that wise step is already felt throughout the district.

But to avoid in future a similar condition of suspense, I would suggest a strict surveillance in respect to new applications for leases of auriferous tracts, especially upon quartz reefs, having already evidence before me that since the cancellations of forfeited leases have been Gazetted dummy applications have been put in, of course all fees paid, but no work done, simply taken up for speculative purposes only, and in no case of leasing tracts appears any work done, the ground lying idle and deserted, except at Richardson's Gully and one portion at the Bonnie Dundee; while, on the other hand, where the ground is held in claims there is life and bustle employment for men and machines, besides considerably increasing the gold escort.

The first to initiate quartz-reef prospecting again during this year was Mr. Thomas Mitchell, an energetic and enterprising miner of the old style, who deservedly met with due rewards by the discovery of a vein beneath the alluvial auriferous deposits of the Bushman's Lead about the month of April last.

The discovery being on the boundary of the division I propose to include it in this report.

The Bonnie Dundee (so is the newly-discovered reef named by Mr. Thomas Mitchell) is situated in the rear of the town of Parkes, commencing at section 19 (as marked in the plan of that town), traversing sections 7 and 8 and entering section 40 near Welcome-street.

The claims on the reef are held, with one exception, as extended block claims in old and abandoned ground. There are about five claims each side of Mr. Mitchell's ground. The width of the vein appears to be from 4 inches to 3 feet. The reef follows the south-eastern strike of the slate. The gold-bearing masses seem to be a sort of rotten brecciated deposit of quartzites and rubble, encased in transmuted chlorite slates, and detrited dioritic matter or greenstone.

As stated, the prospectors' claim occupies within its area an old block claim on the Bushman's Lead, and through its shaft, at a depth of 80 feet, the prospector struck the gold-bearing stuff in April last. The deepest shaft is 90 feet, the lowest level 104 feet. The width of the vein from 4 inches to 3 feet. The dip is scarcely perceptible. There are about 31 men employed. Since its opening the claim gave out 1,060 tons with the following yields: 8 tons, 4 ozs. 10 dwts. to the ton, 70 tons, 1 oz. to the ton, the remainder of tons from 6 to 10 dwts. to the ton.

No. 1 north has some good stone, but has not been fully proved.

The remaining northern portions of the reef are not yet proved. There exists some doubts as to its continuation in the direction wherein the ground is pegged out.

No. 1 south (Ehler's and party) has been regarded as a very promising claim, having shown gold freely in the stone, but a late crushing gave a less result than was expected. Still the claim appears of value. The owners had already raised and crushed 115 tons, 38 tons of which yielded 19 ozs. and 77 tons gave 22 ozs. 10 dwts. The reef was struck at 105 feet depth. Its width is from 6 inches to 3 feet. The underlay seems 1 foot in a foot westward.

No. 2 south has the same appearance as No. 1, and nearly the same results are expected.

The other portions southward are not yet proved but show good indications.

Some few hundred yards westward from Mr. Mitchell's claim on the Bonnie Dundee is the Buchanan Reef, recently taken up by Messrs. Coleman, Paravicini, and party and prospected. There is yet nothing to report upon.

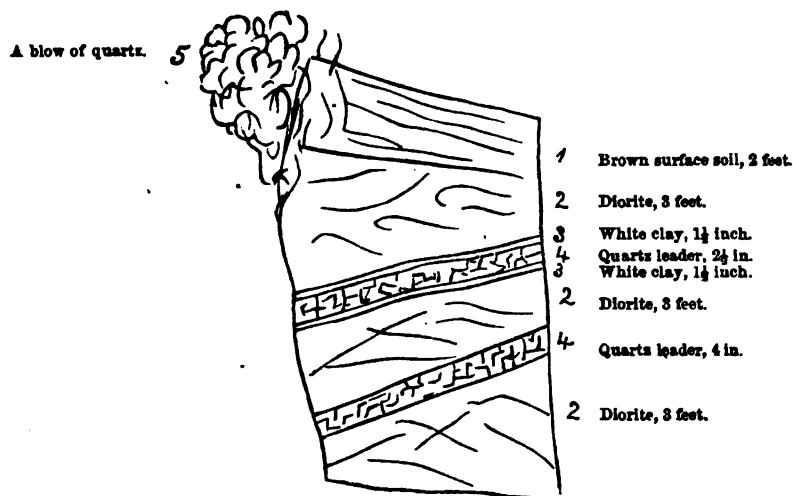
Following the Bonnie Dundee in a south-easterly direction for about half-a-mile we arrive at the head of 'Possum Gully or Tattersall's Reef, a seeming continuation of the Bonnie Dundee. There, too, the vein is traced in the rock under the alluvial deposits, and claims are held there also as extended alluvial in old and abandoned ground. The prospectors, Messrs. Piercy and party, raised altogether from their claim, since its opening in July last, 152 tons, yielding from 114 tons, 54 ozs. The party looked upon this as a poor result and tried their refuse stone, 8½ tons yielding 1 oz. 8 dwts. to the ton, and lately 30 tons brought 8 dwts to the ton. The vein was struck at about 40 feet. Their lowest level is now 70 feet. The strike and formation is similar to the Bonnie Dundee.

At the Victoria Gully, after the cancellation of forfeited leaseholds, Messrs. Wright and party took up, in June last, an extended quartz claim, and irregularly registered it at Parkes. The gully is within at least 1 mile south of the extreme northern boundary of my division. The party now in occupation number six. At 30 feet the vein was reached. The lowest level is 40 feet. The masses of stuff seem to be of great width. 10 feet has been taken out and only the hanging-wall (a sort of sandstone) touched. Of course not all these masses are remunerative, but veins traversing these bodies are found payable. The stuff lying near the shaft looks to be a brecciated rotten quartz and rubble, and had yielded, from 250 tons already raised and crushed, as follows: 70 tons, 12 dwts. to the ton—160 tons, 8 dwts. to the ton—and 20 tons, 8 dwts. to the ton. Though a few tons from the wide reef recently crushed gave very indifferent results, the ground must prove valuable in future, as immense quantities of stuff can be raised, and when cheap carriage and crushing are procurable the results may turn out very profitable to holders.

The cost of carting and crushing from the quartz workings, above detailed, amounts to 5 dwts. to the ton, a most important item, and absorbs thus the greater portion of the yield. It appears also that too much of the poor rubble is taken; by these means it sensibly reduces the result, a thing easily altered by a judicious assorting, because I need scarcely point out that 10 tons yielding 1 ounce to the ton will realize to owners more than 20 tons yielding 10 ounces; in the former case the cost of carting and crushing would equal one-quarter of the gold, and in the latter case one-half of the gold. The refuse stone or rubble may be stacked, and might, at cheaper rates, become of some value in the future.

The Welcome Reef, near the Terrace, had during the early part of this year about 20 tons crushed, at 7 dwts. to the ton. The reef has already given evidence of its payable qualities, and if traced might prove a good investment.

At the head of Richardson's Gully a reef is prospected for by Messrs. Slater and party in ground applied for to lease. I visited it first in November last, and took the following sketch, representing the south wall of the cutting, at a depth of 15 feet.



There were some fine looking specimens produced showing gold massively and freely. The owners have put in a long cutting, at present about 34 feet deep. The leaders showing in the tracing have not continued, but numerous others have been met with during the search; prospects are encouraging.

At the head of the McGuigan's Lead some ground has been prospected, but with no success, though indications warrant a thorough search.

In July last Messrs. Dickson and party struck a fine leader when removing the rock about 3 feet below the alluvia, in a claim on the Fairy Lead, known as Bruce's, and some really heavy gold laden specimens were raised and deposited in the Banks. The party had previously applied for a lease, but when the lease came up they had already abandoned the ground and would not execute it. The area lies now idle. The leader was about 1 1/2 inch wide, ran north-west to south-east, and was not sufficiently traced. The ground, as soon as the lease of Dickson and party is cancelled, will be re-applied for, as people here are still very anxious to own it.

The several crushing machines crushed during the past few months 1,700 tons of quartz, yielding 883 ozs. 9 dwts. 6 grs., showing an average of over 1/2 oz. to the ton—a very marked result.

Quartz-reefs abound in most portions of the Billabong Gold Field, and indications seem good enough, but exertions to utilise them are few and far between, and often very slack and crippled. If only more life were infused into this branch of mining the unearthing of untold wealth might be the consequence.

GENERAL REMARKS.

The gold escort took down from Parkes and Tichborne during the quarter ending—

	March, 1876	June, "	September, "	December, "	Total
ozs. dwts. grs.	5,914 2 8	7,065 17 16	5,887 18 1	4,213 11 21	23,031 9 22

To this must be added—

On hand at the Banks (Joint Stock and Commercial) at the end of 1876	329 15 17
Then purchased by and carried through private channels	1,900 0 10
Total	25,261 6 1

During the first six months the escort carried 12,979 ozs. 19 dwts. 14 grs.; adding to it the gold on hand at the Banks at the end of June last, 1,841 ozs. 18 dwts. 13 grs., and appropriated privately, 1,000 ozs.,—the amount will appear to have been for that period 15,821 ozs. 18 dwts. 13 grs., and 9,439 ozs. 7 dwts. 12 grs. for the now ending half.

It appears that the gold was derived as follows:—

	ozs.	dwt.	grs.
From 68,587 loads of dirt	22,735	12	12
432 tons of cement.....	533	15	2
½ bag do.	150	0	0
1,700 tons of quartz	883	9	6
1,000 loads of pebbles, cradled	140	0	0
44 tons of tailings.....	30	10	0
Total.....	24,473	6	20
At the Parkes Division, from the old alluvial leads (lucidly and characteristically described by the then Gold Commissioner (now Warden) Mr. Dalton in his Report of 1878)	787	19	5
Total.....	25,261	6	1

During the first six months 40,447 loads of dirt were puddled, while during the latter half of this year only 28,140 loads went through the puddling machines.

It is also necessary to draw attention to the fact that while the yield in the first six months of this year was high, the general yield during the last six months from washdirt has undergone great reductions.

It is scarcely necessary to state that the decrease in the yield of gold lies unmistakably in the fact that no new discovery of any consequence in alluvial mining has taken place here for the last two years, and that the old leads are undoubtedly showing signs of failing, while the long continued and still prevailing drought has kept the most of our puddling-machines completely dry, thus actually stopping work as to puddling and retarding mining. Those who raise dirt in quantities have to stack it, awaiting a supply of water; as an instance, may be mentioned Messrs. Jones and party, of the Wapping Butcher Lead, who have a heap of over 1,000 loads of dirt to grass, ready for the carter and the puddler as soon as the necessary water can be obtained.

The continued drought has also prevented much prospecting, and even where prospecting was undertaken the want of water neutralized the energies of the parties, because in most cases not even water to wash prospects could be procured, without carrying the dirt great distances.

With some little perseverance the quartz reefs might be better prospected, lodes picked up or traced, or new reefs discovered, and successfully and profitably worked; and I may be permitted to state my opinion that gold-mining in this district and the localities surrounding Forbes and Parkes is merely in its infancy at present, and that there is undoubtedly a large field yet open, and a bright future looming in the distance.

Other mines too, as already above pointed out, for instance, iron, &c., will be in due time opened up, and very probably profitably worked.

The most satisfactory feature in the events of the last six months is the start to open up quartz-reefs, which may be regarded as an important step towards the permanent prosperity of the district.

The population during the past year of 1876 was throughout greatly fluctuating. At the opening of 1876 Leely's rush attracted from here great numbers; then the Bogan rumours drew some hundreds away, but still about 1,200 of miners, puddlers, carters, crushers, and others, either prospecting or else fossicking, in active occupation, productive and unproductive, remained. The general population—tradesmen, business people, women, and children included—would be from 3,500 to 4,000 souls. Of course the rumours from the Brookong Gold Field will reduce the population considerably.

The number 1,200 will give an average of £275 11s. 10d. to the man per annum on a division of the value of gold, the product of the districts being £290,663 8s. 6d. During the first six months of the present year the average yield was according to the amount of gold over £2 per man per week.

In concluding I shall take the liberty to state that the courteous, effective, and prompt manner in the dealings with all matters connected with the Department of Mines, has been a source of much gratification to the public.

The appointment of Inspector for Mines and the issue of regulations relating to the inspection and provisions for the workings in mines on the various fields are looked upon as most judicious, and it is expected that all districts will be brought under the operation of inspection.

LACHLAN DISTRICT—CARGO DIVISION.

(*R. Hutton, Mining Registrar.*)

SINCE my last report the alluvial mining on the Cargo Gold Field has considerably decreased, both as to the number of men employed and the yield of gold. Four of the claims mentioned in a former report are still at work, the rest being abandoned. The claims at work are as follows:—Hicks & Co., Odgers & Co., Rickey & Co., and Simmeon & Co. The last-named claim was formerly worked by Groat & Party, who abandoned it when the rush set in to Mandurama; but the claim has since been taken up by the present proprietors who are making very good wages out of it. The average yield from these claims during the year has been a little over 5 dwts. to the ton. Besides the claims referred to, there are about twelve men working in the old ground, who seem to make small wages. There has been during the year about 4,700 tons put through the puddling-machines, and

1,180 oz. of gold obtained, which is the total yield of alluvial in the division during the year. There is no material alteration in the vein in any of these claims since last reported upon. The total number of men employed in this branch of mining is forty.

In quartz mining there have been four leases at work, viz. :—

The Ironclad Gold Mining Company	Ironclad Reef.
Mathieson & Party	"
D. L. Bayliss	"
Elder & Company	Victoria Reef.

The Ironclad Company refuse to give any information as to their operations during the year. (Expecting to get the results from the local director in compliance with a circular forwarded to him.) I did not make much inquiry with regard to this company, and was considerably disappointed when told that they refused to give the information. This much, however, is generally known : The property has been in full work during the first eight months of the year, during which time from thirty to forty men have been employed, and the results equal, if not better, than formerly. The reason of the stoppage was the ground was stoped out down to the level of the bottom of the shaft and the company (anxious to reduce the expenditure) called for tenders for sinking further, but found that no one would take it at a lower figure than it cost on the wages system (a fact which I consider speaks well for the manager, Mr. R. Heyes). Consequently operations are again about to be commenced on the wages system. The present depth of the shaft is 338 feet. I may here state that at this depth the vein was very narrow but rich in gold. This shaft is the deepest in the division.

Mathieson & Co.'s ground joins the Ironclad Company's. On the south side this party are at present trying to get machinery to treat their stuff, which contains so much pyrites and other mineral that ordinary crushing would not save one-half of the gold. If perseverance deserves success this party ought to succeed ; they have been at work on this ground for the last eight years ; they have about 150 tons at grass, and if assays are any criterion it will yield well ; but the difficulty is how to get the gold from it. During the mining excitement four years ago this party valued the property so highly that they would not put it in the market, and now, if a miner applied to a capitalist to speculate in a *bond fide* property such as this, he would very likely be insulted and set down as an impostor and swindler ; it will be years before the ill effects of that mining mania are forgotten.

D. L. Bayliss's lease joins the Ironclad Company's on the north side ; sinking has been going on in this property for the last four months ; the depth attained is 60 feet ; the prospects are good, but the reef has not been struck yet.

Elder & party are still persevering prospecting their ground ; they have had 12 tons crushed lately which yielded 2 ozs. to the ton. In this property there is a net-work of rich but very narrow veins, and it is the opinion of every miner here that there is a really good reef in the ground. I do not know any place where a small amount of capital could be more judiciously spent ; they have two veins, either of which would pay the expenses of sinking upon, and in all probability these would lead to a good reef ; but this capital cannot be got. The miner is now paying the penalty for the swindles perpetrated in his name four years ago ; I say perpetrated in his name, because it was not the *bond fide* miner who was guilty of these acts, but sharpers from the city of Sydney and other places, who, when the reaction set in, retired and left all the odium on the miner.

There has been no mining done in Canowindra, Toogong, or Boney's Rocks during the year.

LACHLAN DISTRICT—GRENFELL DIVISION.

(W. F. Parker, Mining Registrar.)

I HAVE the honor to report that during the past year no improvement has taken place in the prospects of this division of the Lachlan Mining District. Up to the end of December last not more than sixty-five miners altogether were actually engaged in mining for gold (there is no other description of mining carried on here) ; say forty-six miners in and around Grenfell, and nineteen at the Seven-mile and the Quandong. About September or October last a small rush took place at the Seven-mile ; I should suppose from thirty to fifty miners came there in addition to the above, but they only remained for a few weeks, and then left for other places ; the cause of their leaving was no doubt for want of water, and on account of the ground being poor and patchy. I may state that the dams both at the Quandong and Seven-mile are all dry. Up to the end of the month of December there were not more than twelve men working at the Seven-mile. They were sinking three shafts at a depth of not exceeding 90 feet ; there is about 800 tons of wash dirt to grass that cannot be washed until rain comes to supply the dams. At the Quandong there are seven or eight men that have been working off and on last year. John O'Brien, who has three puddling-machines, has informed me that he has puddled about 750 loads of wash-dirt, and a puddler named John Dodd about 150 loads (which includes all raised at the Quandong and Seven-mile), yielding about 400 ozs. of gold.

Grenfell and Suburbs.

There are a few men now working on alluvial ground at the One-mile and near the main lead, but they were not working there during last year, and have done nothing yet.

The Consols Gold Mining Company, formerly known as O'Brien's Reef, has been idle for the greater part of last year, the capital of the old company having been all expended. This claim has lately been taken up by a new company in thirty shares of £100 each, and have resumed operations ; at present they are merely pumping the water out of the shaft, the present depth of which is 716 feet. The mining manager, Mr. W. Veal, informed

me that he expected to have the water all out by the middle of March, and that he will then commence driving east for the reef; eighteen men are now employed in this claim; little or no work was done during 1876; no sinking since the month of February; 560 tons of quartz was raised during the year (obtained at a depth of from 150 to 200 feet), which yielded 287 ozs. 10 dwts. The winding gear and machinery in this claim cost the old company upwards of £1,000. Referring to the past history of this claim, I may state that from the beginning of the year 1868 up to the middle of 1870 the quartz stone raised in this famous claim yielded gold to the value of nearly £200,000. To shew the confidence still felt in the claim the principal shareholders in the present company were original shareholders, and they have not lost faith in its future prospects. If this company should succeed in striking a good payable reef at the present depth there is no doubt whatever but that quite a number of the reefs that are now idle will be worked with profit. Prominent amongst these are the two celebrated claims, the Homeward Bound and the Lucknow Reefs, being only second to the Consols in point of richness.

Homeward Bound (Engel's).

This reef was only worked for a short period during last year, and is now idle. Four men in this claim raised 225 tons of auriferous quartz (obtained at a depth of about 200 feet), which yielded 97 ozs. 10 dwts. 20 grs. There are two shafts on this claim of the respective depths of 250 and 380 feet. Homeward Bound (Tuff's) and the Lucknow Reefs—both these claims were idle during the whole of last year.

Between the 1st January and the 31st December, 1876, 120 miners' rights and twenty-four business licenses were issued by me, and the quantity of gold received by the three banks here (the Bank of New South Wales, Australian Joint Stock Bank, and Oriental Bank Corporation) during the same period was 1,404 ozs. 5 dwts.; out of this quantity 748 ozs. 4 dwts. 18 grs. was forwarded by the Gold Escort *via* Forbes. I beg further to state that in consequence of the reefs being only worked for a short time last year it is impossible to get the full particulars required to complete the returns. For the present year I will endeavour to get information from the claims every month, to assist in making my next report more complete.

LACHLAN DISTRICT—YOUNG DIVISION.

(J. R. Edwards, Mining Registrar.)

In submitting my report for the year 1876, I have the honor to point out that gold-mining in this district can scarcely be regarded as a distinctive branch of industry, for most of the persons now engaged in it follow other occupations, and resort to gold-mining occasionally, when opportunities offer, and thus make it an auxiliary to their other means of obtaining a livelihood. Most of those who hold registered claims have farms under cultivation, or follow occupations by which they could maintain themselves and their families apart from gold-mining, and those who work old abandoned shafts and wash up rubbish are what are termed "fossickers," and cannot really be classed with gold-miners properly so called, although they help to swell the aggregate yield of gold for the district. A great deal of the gold won in this way is obtained by Chinese, who subsist on an income that would be totally inadequate for the maintenance of a similar number of Europeans. Moreover, labour to be of any benefit to the Colony should be profitably employed, by raising more from the soil than is merely necessary to clothe and feed the individual. A European usually realizes this, and hence, "fossicking" on poor ground like this around Young is confined nearly to the Chinese, who are satisfied to work for a subsistence.

The past dry season has had a most depressing effect upon gold-mining generally of the nature that is carried on in this district, for there is neither river nor creek having a permanent supply of water. The claim-holders have to depend wholly upon the water stored in dams and reservoirs, and however large the quantity thus saved may be, it soon becomes exhausted in a dry season like that we are now passing through. The "fossicker" relies mainly upon showers to pursue his occupation, and when no rain falls for a considerable time he has to abandon his calling. The "prospector" too in such a season as this cannot find water sufficient for domestic use. When therefore the unusual drought that we have experienced is considered, any return which may be made of the yield of gold for 1876 must necessarily fall far below a fair representation of the capabilities of the district. Great hopes are entertained by experienced miners that new ground of an auriferous character will yet be struck in various parts of the district, particularly to the west and north-west of Young. Some trials have been made during the year, but the dry weather has baffled the prospectors and they have been compelled to return without any success. There was a rush to Cumbamurra during the year, but it did not prove successful. The ground was found to be very patchy, and the washdirt did not yield more than 5 dwts. to the load.

In the extended claims which are worked by sluices, the ground is taken from the surface to a depth of 16 feet, and from the information I have been able to collect, the yield appears to average 12 grains of gold to the ton of dirt. There are a few claims of another character to be worked by machinery, where the sinking will be deeper, but active operations have not yet been commenced; but as some large companies, with excellent steam machinery, failed on former occasions to obtain a profitable return for the capital invested, it would not be safe to anticipate very large results.

Since the discontinuance of the gold escort there is no means of checking, officially, the quantity of gold transmitted to Sydney. Nevertheless, I have every confidence in saying that the particulars I have gleaned are quite accurate; the quantity of gold purchased in this district during 1876 was 1,020 ozs. 18 dwts. 12 grs., which at an average value of £3 15s. per ounce gives in round numbers £3,828. The number of miners' rights issued during the year reached 252. It is probable that fully one-half of these are held by persons who are not gold miners, but merely hold the documents to take advantage of anything that may happen, to vote at an election,

or to qualify themselves to apply for land under the improvement clause of the Crown Lands Act. On the other hand probably one-half the persons engaged in gold mining do not hold miners' rights, so that the number issued may be taken as a fair representation of the persons employed. We then have the average earnings of the persons actually engaged in gold-mining at (say) £57 per man for the year. The most of the gold however is raised by a few companies.

The Bannerman Reef is the only quartz holding that is spoken of. Work however is suspended, and although it is said about 800 tons of stone are on the surface there is no machinery nearer than 70 miles, a distance which is too great to allow of the quartz being carted for crushing.

SOUTHERN DISTRICT—BRAIDWOOD DIVISION.

(*W. F. Robertson, Mining Registrar.*)

THERE cannot be said to have been much progress made in the mining operations on the gold fields in the Braidwood division during the past year; there has however not been any falling off in them. The yield of gold has apparently kept up to its ordinary standard both in quantity and quality; and indeed the quantity showed somewhat of an increase upon the previous years yield.

The quantity of gold gained in the portion of the Shoalhaven River Gold Field, which lies in the Braidwood division, was about 500 ozs., and its average value has been from £3 15s. to £3 17s. per oz. The mining on this field is carried on principally upon the banks and in the beds of the river and its several small tributaries, and is nearly all surface working and ground sluicing.

There has been but little addition made to the machinery and plant of this field,—the only additions being in the shape of water-wheels and from 8 to 10 miles of water-races.

The Shoalhaven River Company's lease has continued to be very successfully worked, and has, as I understand, proved fairly remunerative to the proprietors, and the claims near the Bombay Crossing-place, as also all of the several claims situated upon the river from Back Creek to Nerriga, have produced very fair average yields of gold to the miners employed upon them.

The Jembaicumbene Gold Field is now worked principally by the Chinese, who apparently have done pretty well upon their claims; there are several claims ranging from two to twelve men's ground with all the necessary plant, water-wheels, pumps, and races. The yield of gold has, however, diminished very considerably from what it was even so recently as in the year 1875. The quantity yielded during the year 1876 being only some 320 ozs., and its average value per oz. is about from £3 13s. to £3 15s.

SOUTHERN DISTRICT—ARALUEN DIVISION.

(*E. F. Carlile, Mining Registrar.*)

MY returns for the year 1876 show a larger number of miners' rights issued, and more men at work; the latter however, are far in excess of the former, which is accounted for by the fact of a great part of the mining in this division being on private land, the miners on which do not require "rights," although some obtain them for the purpose of securing certain privileges conferred thereby.

The invitation issued by the department to mine-owners and others to fill up forms, giving the quantity of gold obtained, the number of tons of vein stuff operated on, and other information, has been responded to but feebly. Generally speaking, no regular account is kept of the quantity of dirt washed; and as a rule the miners are averse to giving particulars of their earnings. Those working on private land have the further objection that a return of the gold won by them would be misleading, as the expenses incurred in getting it would not be stated, and the impression would thus be given that their earnings are larger than is actually the case. As far as I have been able to ascertain, the general average of alluvial washings is about 12 grs. to the ton of wash dirt. The total yield of gold from the division I have not been able to get at, as the Banks (the only gold buyers) refuse the information. The yield from quartz has been 211 ozs. 14 dwts., valued at £725 11s. 6d.

The boxed tail races mentioned in my last annual report as having been commenced have been continued during the year. One of them is now on the granite bottom, and effectively drains the claim, thus saving the great expense which was formerly incurred for pumping, and enabling ground to be worked which could not otherwise be done. In another claim a similar race has been brought to within about 8 feet of the bottom where some ground has been met with which is expected to pay for working. By the time this race reaches the ground it was originally intended to work, it will be on the bottom; in the meantime the drainage is effected by means of a water-wheel and California pump. These races have each cost £2,000, and are a mile in length. One of the claims drained is protected by two weatherboard dams which cost £500. It is contemplated by some of the other claims to construct similar races. Three new claims have recently been commenced, which, if remunerative, will afford employment to a considerable number of men; two of them have begun washing, but it is too soon to speak of their general prospects. The drought during a great part of the year almost put a stop to ground sluicing, but it revived when rain came. On the other hand some of the stripping claims suffered by the floods,—two or three of them having been filled in on two occasions. On the whole the outlook for returns from alluvial mining is brighter than at the beginning of the year.

But little quartz mining has been done during the year, and that altogether in one part of the division (Bell's Creek), where an attempt was made some time since to work some mundic stone (said to be rich), but soon discontinued; there are now from 80 to 100 tons quartz ready for crushing. A heap of ordinary quartz tailings was re-crushed—weight not known; the result 14 ozs. 4 dwts. gold. No pyrites have been treated.

In my last report I gave the mode of working and nature of the ground; I have nothing to add thereto, no new methods having been introduced.

Gold is the only metal or mineral sought for in this division.

SOUTHERN DISTRICT—MAJOR'S CREEK DIVISION.

(John Heazlett, Mining Registrar.)

THE statement forwarded herewith of the quantity of gold won within my division cannot be considered as accurate, some parcels having been sent to the Mint, some sold at the banks at Braidwood and elsewhere, and some parcels have been purchased at this place from parties working outside my division, and to find out what the Chinese have been obtaining is certainly more than I can do.

The statement of the number of miners within my division, is pretty near the mark; those working on private lands are included in the sum total.

The statement of the quantity of stuff put through the puddling machines and the yield of gold therefrom is not to be relied upon as quite correct, the miners keep no account of such matters, and unless this has been done it is impossible to arrive at anything more than an approximate estimate. The owners of such machines have, however, given me as nearly as they could guess the number of loads, the weight of each load puddled during the week, and the yield of gold therefrom, and upon those conjectures have I based my calculations as to the quantity puddled during the year and the amount of gold won.

Although a few tons of quartz veins or leaders have been taken out and crushed, the result of which appears in the tabular form herewith, I cannot say that any quartz mining has been done during the past year; as those small leaders are often found when flooding off the alluvium, in which case they are taken out in dry seasons, and stacked until enough has been raised to make a small crushing, and in some instances a few tons have been raised by fossicking through the old workings in very few cases do the parties earn wages, in some not half wages, and in a few the proceeds were absorbed in carting and crushing. The large reefs have been idle for a long time past, owing to the mundic having been met with so near the surface, when a full stop was made.

Field and Heazlett's leased tract of 8 acres on eastern slope of Big Hill is about as it was twelve months ago; having expended about £1,100 in sinking, &c., they very wisely determined they would ascertain the value of the mundic before spending any more cash, and for this purpose a parcel of the mundic was sent to England for treatment, and as yet no returns have been received. This reef is 6 feet wide in some places, but will average about 2 feet only; the shaft is about 200 feet deep; no drives as yet. It is said that the stone from this claim will be very difficult to treat consequent on the variety of minerals intermixed.

The Messrs. Wilson & Co. on the same line, but (private land) are down about 90 feet, not working, being unable to extract the gold from the pyrites. At Spring Creek is Dargue's old reef, or what is known as the Homeward Bound, down about 70 feet and is about 18 feet wide. There is also what is termed the Blow, or Tomson's old reef, a short distance from Dargue's, which is a good width also, but am not certain as to the number of feet. There are many other reefs of less notoriety situated on private land, and in which there is a great body of mundic.

On Red Hill (Crown lands) is what is known as the Rise and Shine Reef, the shaft on which is down about 90 feet and on mundic and water; this has been idle for years past. This line extends for about 240 yards in a westerly direction, when it became so narrow that it would not pay, and some stone from this line has not done more than pay for carting and crushing; the width of vein is from $\frac{1}{2}$ inch to 4 inches, and the best stone yielded 3 ozs. per ton if my memory serves me aright. On the eastern end of the line from prospectors' shaft nothing has been found; probably the sudden dip in the direction of the Main Creek might account for this; indeed I have not heard any opinion expressed as to the cause. On Chinaman's Flat there are a few narrow veins some of which paid very well through the decomposed granite, but on reaching the hard rock and water the mundic made its appearance; hence it was left as other places had been. Since then a company put up an engine and pump and went down about 60 feet, and left it; could not make the mundic pay. Moreover the vein is not wide enough to induce capitalists to invest. The reefs (if such they can be turned) on Crown lands already opened are nearly all very narrow.

Messrs. John Masters & Son, late of the Pyrites Reduction Works, Thames, New Zealand, are now here for the express purpose of testing the value of the pyrites, and in order that they should not return without effecting their purpose a public meeting has been held and a committee appointed to raise funds, and to take out of each of the widest reefs about 10 tons of stone, this quantity from each reef being considered sufficient for a fair trial, and somewhere about £30 only having been subscribed. The committee is not "for the present" able to do more than raise 10 tons from Dargue's Reef, but in the event of this proving satisfactory there is some reason to hope that more assistance will be given so as to prove one or two more of the widest reefs.

I have forwarded to Mr. Warden De Boos, at Braidwood, a small bag containing samples so ticketed that there will be no difficulty in ascertaining from what locality they have been taken, &c., and when enough has been collected to make up a large parcel, Mr. De Boos will have them forwarded to the Department of Mines. If permitted to give an opinion, I should say that samples from those narrow leaders are not of much value nor can they possibly prove the value of the leaders, unless taken from a considerable depth; the veins here are so narrow that nothing less than 7 or 8 ozs. to the ton would pay for going through rock and water. In the event of

the mundie proving payable I shall probably have an opportunity of sending a large parcel of samples from some of our widest reefs ere this year will have expired.

In alluvial mining but little progress is being made. On Long Flat it is all old workings, and no chance of extending in consequence of the land all around being private property, some of which is well worth working, yet the Government has given it away at £1 per acre. This Flat is worked by means of puddling machines, the soil being stiff, water takes but little effect upon it, and even were it otherwise there is not sufficient to flood it off, and in dry seasons there is not half enough to keep the machines going; still I think the miners here are on the whole doing much better than those on Major's Creek where they are entirely depending on water for a living, and as this cannot be obtained, except when rain comes down in torrents, it is easy to see that poverty must prevail. There is no ground here to pay for putting through machines, hence it is all flooding off old workings and ground sluicing where the ground is shallow or surface only. To do well or even middling on this creek we would require from a fortnight to three weeks wet weather each month—otherwise the Shoalhaven River—and neither of these are likely. In wet seasons there is a large volume of water passes down the Back Creek, some 2 miles from Major's Creek, and would be of great service to the miners were it not for the private land in the way of cutting races and bringing on water; and the owners of said land being unwilling to allow this to be done, even where compensation has been offered the privilege has been refused. The Mining Act, 1874, does not, as did the Gold Fields Act of 1866, make provision for leading water through private property.

On Jembaicumbone there is no sign of progress; in fact the whole swamp has the appearance of having been completely deserted. The European population having gardens and a cow or two to give them milk, struggle on by some means, and from what I can learn, many if not all of them go road making and take any other jobs they meet with, and when this fails come back and fossick about through the old workings for what they can get. The Chinese, who are still on this field, are but few compared with their number a few years back, but as they can live on much less than Europeans can, they knock out quarters somehow; perhaps it is that they know how to work amicably in large parties, a thing white men have not yet learned.

I find there is not the slightest use in serving the miners with circulars or forms to fill in, they will not refuse, but when the time arrives for collecting them they have either forgotten all about the matter, or did not know how to do it; at the same time I confess I can see no other way whereby statistics can be correct. There are some miners who will not allow me or any other person to know their business, and there are others who would not keep an account of what they are doing, if even paid for it; not a few of them have told very plainly that the giving of such information as they have been asked for does not appear to them beneficial to the miners, neither do they believe that the Government is doing anything to advance their interests, but the contrary. They say that the selling of the auriferous lands, and then giving those freeholders pre-emptive leases on the gold fields, is a rather strange method of advancing their interests, and that this is what has been done, and is still being done on this gold field, the result of which is that all who are able, or think themselves able, to stand the fatigue of road-making and railway works are obliged to travel the country in search of a job wherever it is to be found, and even old men whose heads are white have to do the same thing. They say that they were under the impression that each miner could keep a cow or two and also horses to do their work, but here they are obliged to either sell their cows or send them away to grass, thus leaving their children without milk. Believing that it is not a part of my duty to enter into details concerning the many complaints made by the miners respecting the closing up of this gold field, I have confined myself to merely a few remarks just as they have been made to me.

I do however believe that when called upon to furnish the Department of Mines with a statistical report, not only of the mines but also of the progress being made by the miners, and that such reports will be considered valuable, and the more so when such reports are accurate, and having already stated that I did not consider mine as anything more than an approximation to the truth, I have thought it well to show that whilst the miners are suffering under what they term an injustice at the hands of the Government, they are not likely to give themselves much trouble to assist me or any other official to make out a statistical report.

Lest it should be thought that the miners are grumbling without any just cause, I will take the liberty to say that they have great cause, and in the event of the reefs being developed and water being brought here from the Shoalhaven River it will be discovered, when too late, that the alienation of land on this gold field has been a gross mistake. Should the mundie reefs or other reefs be found, and no doubt there are plenty to be found, firewood will be a dear commodity; and should water be brought on, licenses will be demanded by the owners of the auriferous land sold since this gold field was first opened, and although this is prospective what has been done is felt by the majority of the present population of this gold field.

SOUTHERN DISTRICT—LITTLE RIVER DIVISION.

(P. James Galway, Mining Registrar.)

In this division the rainfall during the years 1875 and 1876 has been at its lowest. Sluicing being the chief mode of working, gold-mining is very dull more particularly with Europeans.

The Chinese taking advantage of the dry seasons have re-worked large portions of the river-bed with I believe fair returns. Working in parties of from eight to twelve they make ground pay that Europeans would not look at; being very handy in erecting water-wheels and pumps and endowed with a good share of patience and perseverance they surmount every difficulty in putting their claims into proper working order.

The chief water-races here taking their supply so high up the creek in order to tap the surface hills, require a wet season to procure a sufficient supply, and flood-races are all idle except in wet seasons.

The races heading from the river are chiefly used in driving water-wheels and washing, river drift being too low to command any of the hills.

The land bordering the river near its source (where it would be necessary to start races to carry water sufficiently high) being all private ground prevents the cutting of races that would have a constant supply. One race, the "Warrambucca Company's," that heads from the river, has paid £50 per year rent for permission to pass some short distance through freehold land, but the rent is chiefly demanded for the use of the water, which is used by sawmills on private land lower down the river.

Other races pay from £2 to £6 per year for passing through land lately alienated and within the watershed of this gold field. But I am glad to hear that from the representations made by the Warden no more land will be sold within the reserve; every opportunity is taken by the erecting reservoirs to increase the water supply and in time dams large enough to retain the water that now goes to waste during floods will be erected. The combined length of the races held here is 180 miles and include 4,800 yards of fluming; in many parts 40 feet in height and 700 yards of tunnels.

There is a large area within this division not yet prospected. Storekeepers and business men in the Braidwood District make no effort to keep the population on the gold fields either by organizing or assisting prospecting, and this fact is surprising as the miners on the different gold fields were their best customers. In a district like Braidwood, that cannot be styled either a pastoral or an agricultural one, when gold-mining declines every other industry follows suit.

Respecting the quartz reefs no effort has been made during the year to further test their productive reefs though as the annexed returns will show they offer a large field for the profitable investment of capital.

There are some forty-two distinct reefs, and from thirty-one shafts there was crushed at the St. Vincent machine 1,096 tons of stone which with specimens gave 1,977 ozs. gold; from eleven other reefs, situated principally at Warrambucca, 1,000 tons returned an average of 15 dwts. to the ton.

The deepest shaft was Burrill's, 150 feet; amount of stone 249 tons, yielding 271 ozs.

Water was found at 40 feet; the pump throwing from 80 to 100 gallons per minute kept the shaft dry; the water all came from above the 60 feet level; the sinking through soft slate and mullock rock.

The next deepest was the "Homeward Bound," 100 feet, with from 150 to 200 gallons water per minute; from 30 feet from surface, at 30 feet, 400 ozs. gold was obtained from an oil-can of stone; at 50 feet, 200 ozs. in specimens were obtained; 46 tons of stone yielded 37 ozs. 5 dwts. gold.

The St. Vincent Reef gave 450 ozs. from a bucket of stone 12 feet from the surface.

On the other reefs from 40 to 60 feet was the depth reached, water showing at the same level, 40 feet, and requiring pumping machinery; as the claims were entirely in the hands of working miners they were unable to procure machinery for their proper development, and from that reason an industry that promised to invigorate the entire district lapsed. As the reefs are from 150 to 200 feet above the river-bed, and the water in the reef lessens as you sink down, it is probable that after pumping for a time the ground would become drained to a level corresponding with the river-bed.

The trial crushing of 10 tons, mentioned in report 1875, went 30 dwts. to the ton; this was taken from a cross leader running into Burret's Reef; the water prevented further trial.

The attention of some miners at Gulgong being called to the basalt formation referred to in my last report, for the information of miners generally I annex the report sent them at their request for more definite details:—

"Report on the belt of rock mentioned in M. Registrar's Report, 1875.

"As requested, I send you particulars respecting the belt of rock mentioned in the Mining Registrars' Report, January, 1876, and to prevent any misunderstanding of its true formation enclose three samples.

"No. 1, taken from the face where it crops the Currawang Creek, the depth here visible is over 400 feet.

"No. 2, taken about 500 yards west of the belt from bottom of a hole 40 feet in depth.

"No. 3, mineral which forms on the roof and side of caves or hollows in the rock, many of which are to be found where the belt runs through the coast range when nearing the Shoalhaven River. Here the belt is more than 1 mile wide; but under the Buddawang Ranges it varies from 200 to 800 yards.

"The width—72 miles—in Report, 1875, is an error in printing."

Though called basalt in the Registrar's Report, subsequent inquiry induces me to believe that puddling stone is the name the rock is more generally known by, being in many places thickly interspersed with pebbles of different sizes, but I learn from practical parties that a true basalt formation shows in the same belt, where it crosses the Shoalhaven River and payable gold was procured on a slate rock, underlying the basalt.

A strong colour was obtained from a mullock slate in one of the caves.

Fine gold has been got from the surface wash in several places which is of a white sandy nature a few feet in depth.

After floods the slate rock can be seen under the strata where it crosses the creek and low grounds; the belt can be traced from Monge, Clyde Road, to the Shoalhaven River—some 40 miles.

The timber on and near the belt consists of mountain ash, gum, and mermate, with patches of hickory scrub. The water in the creeks flowing from or near the belt is good, but taken from holes sunk in the creeks is not drinkable, and soon covers everything coming into contact with it with a brown scum.

*No gold has been found on the east side of belt. The Little River Gold Field runs parallel with its western side and has produced some of the coarsest gold found in New South Wales.

The sand on the west side of belt is of a rich chocolate colour and extends about 40 chains in width, producing splendid root crops.

*I find from information received from a practical working miner, on whose statement every reliance can be placed, that lately prospecting the country on the coast or eastern face of the Buddawang Ranges he found gold in nearly every creek and gully tried,

I have made every exertion to obtain a separate return from the different sluicing parties, by supplying the usual forms and also calling personally at the claims but without effect; being told that it was impossible to state the amount of dirt removed in a sluicing claim or passed through boxes in a river or creek, all sluicers agree in stating that 6 grs. to the ton will pay good wages, taking into consideration the time occupied in properly breaking up, scraping, and brushing the rough and hard slate and sandstone bottom found here.

SOUTHERN DISTRICT.—NERRIGUNDAH DIVISION.

(*W. J. Foster, Mining Registrar.*)

1st. In quartz mining, work has been entirely suspended in all the claims during the last three quarters of the year, except Wild Reef, Wagonga. On this reef the owners have crushed 141 tons of stone, taken from a depth of from 20 to 30 feet, which gave an average yield of 2 dwts. 7 grs. per ton. This result was not sufficient to cover the cost of working, and work has therefore been suspended during the past 5 months, and it is likely to continue indefinitely. The owners of the engine are now working a saw-mill with it, and quartz-mining in this division will remain in abeyance unless some new and richer discovery than the present known reefs should be made.

2nd. In alluvial mining there have been no discoveries or changes to note.

The work during the past year has been entirely confined to working over the old ground and such fragments of new as were found amongst and in the immediate vicinity of the old. All efforts to open new payable ground have been fruitless, and the results to the miners, blanks. There is no present prospect of a change for the better.

3rd. The return herewith of gold, quantity and value, is for the whole year ending 31st December, 1876.

4th. There are no mining companies in this division. The work is all done on the co-operative principle, and no European party exceeds six in number.

SOUTHERN DISTRICT.—SHOALHAVEN DIVISION.

(*W. Lovegrove, Mining Registrar.*)

In my report of last year I stated that mining of all sorts, except for gold, was at a standstill.

The same state of things exist now. A large outcrop of copper has been reported to me and samples shown of yellow sulphides, but the locality is not clearly defined, and the discoverer, a half-caste, does not seem inclined to give information.

The want of capital in gold-mining still exists, and the only machine is the one described as progressing last year, and which is nearly completed. It is as follows:—An undershot wheel of 12 feet diameter drives a revolving set of hammers inside a funnel-shaped receiver. The speed is great and the quartz is reduced to flour, any pebbles escaping being caught by a second and third receiver belted on to the main shaft. The pans and tables are similar to those employed elsewhere. A large dam and race of 350 feet have been constructed, but much water escapes through the dam and over it, and the head is insufficient to keep the machine going at full speed. The machinist, Mr. Griffiths, claims that when rain falls he can crush 60 tons a week, but I cannot estimate it so highly.

There is no doubt that the want of machinery has been the sole want in gold-mining at Yalwal, for the reefs are large and high above water-level. Stone ought to be deliverable at a machine at from 6s. to 15s. a ton. I have no doubt the miners at present on the ground could deliver 20 tons a day; but in the present state of things they are increasing their paddocks very slowly.

Eighteen leases have been forfeited during the year, but they would all be retaken on a favorable crushing being carried out.

Much interest is exhibited in a new reef which is just opened by Messrs. West and Harvey (No. 1-76, 4 acres. Not yet surveyed.) The reef dips westerly and strikes about S. 10 W., showing clearly defined walls 6 feet assunder. I forward samples of the stone which, like all Yalwal stone, shows very little gold until crushed. It is opened about 4 feet wide and the cut is 8 feet deep. There are cross-cuts and holes on the other claims at work, but generally the work done is insignificant.

SOUTHERN DISTRICT.—MORUYA DIVISION.

(*William Clarke, Mining Registrar.*)

In making my annual report I wish to draw your attention to the fact that there are great difficulties in the way of obtaining reliable information concerning mining matters in this district. The people are either so apathetic or so reticent that they will scarcely answer inquiries respecting their mines.

The mining industry in this district during the past year has not been quite at a standstill, but I may safely say the amount of work done and of capital employed has been but trifling.

and more generally in a large creek heading from the basalt. The country is very broken, and scrub and vines so thick he had to cut a path in many places; being alone and obliged to return for provisions, the search for gold was very imperfect, but proposes to give the ground a further trial when better prepared.

The coast face from the Buddawang Ranges extends from the Clyde River to the Pigeon-house Mountain, some 30 by 15 miles, and presents a good field for a properly equipped prospecting party, very fair patches of gold having been found in many creeks falling into the Clyde River; and gold has also been obtained near the Pigeon-house.]

The Mogo Gold Field has been the only one worked during the past year, and the miners employed there have only worked for a few weeks at a time, and not continuously. The reason of this is, that the so-called "miners" also follow some other occupation. The total number of miners employed on this field were twenty, and the mining has all been alluvial.

The quartz reefs have not been worked at all with one exception, and that one is the lease known as "The Moruya Silver Mine," now the property of Mr. Hunter. This mine was taken up for the purpose of working and treating the ore there, which contains silver, lead, gold, and other substances. During the past year 1,500 tons of stuff were raised, consisting of 500 tons alluvial and 1,000 tons of quartz, which yielded 620 ozs. of gold. The great difficulty the proprietor of this mine has to contend with is the separation of the various minerals contained in the ore, and when this is mastered I have no doubt the mine will be a valuable one.

No tailings or cement have been crushed, no pyrites have been treated, and no nuggets have been found, that is, "I am not aware of any." Annexed you will find returns showing the number of miners employed during the past year, and how they were distributed, the quantity and value of gold won, the machinery used, and the particulars of the lease known as "The Moruya Silver Mine."

In conclusion, I may state that I am of opinion that until the proper mode of treating the quartz and various ores is understood, and until capital is employed, the mining industry in this district will not flourish.

TUMUT AND ADELONG DISTRICT—ADELONG DIVISION.

(William J. Shelley, Mining Registrar.)

I HAVE the honor to report to you that gold mining operations in this division for the past year are scarcely marked by any new feature. The yield of gold has been considerably less than I anticipated, and although mining matters are at present quiet, yet at the same time I feel assured that there is every reason to believe that there will be an improvement ere long, owing to private parties having taken up fresh ground, which appears promising, also from payable gold having been obtained at a depth of over 800 feet by the Great Victoria Gold Mining Company. I have tried to obtain the fullest information respecting the gold won and bought, but owing to some of the gold buyers not keeping a separate account, showing whence the gold comes, it is impossible for me to do so.

The returns of gold won in the district is 9,234 ozs.; to be added to this is the gold obtained from the alluvial workings at Sharp's Creek, and won by small parties of miners in isolated diggings.

I have not received any report from the Excelsior Company, Donkey Hill, the Frouse & Woodward's Gold Mining Company, nor the Burrangong Gold Mining Company. I am also sorry to say that, owing to Mr. Shepard being away from the district I am unable to give you a return of his gold, but from what information I can obtain I should estimate the yearly return at 15,000 ozs. There is a large parcel of Tumberumba gold sold here, but it would not do for me to report it in my returns, that being included in the Tumberumba returns. Of the 15,000 ozs. I consider there would be 5,000 ozs. obtained from alluvial workings.

There are two alluvial leads at Shepard's Town and on the Adelong Creek, and the width being about 60 feet. The number of men employed in the alluvial mines is 105, exclusive of 10 miners working alluvial on Sharp's Creek. The mode of working the Adelong Creek is driving and blocking; that of Sharp's Creek stripping and sluicing. The approximate area of abandoned alluvial ground is about 100 acres, the cause for abandonment being on account of the ground being too poor to pay for heavy machinery, and there being too much water to allow of its being worked without.

The number of quartz veins in my district is 13; some are abandoned, being too poor; yet many a mine would pay well if they had their own crushing plant, and one great drawback here is the hardness of the country, the sinking and driving being too expensive.

Amongst the several lines of reef which are now being worked is the Victorian line, upon which are the following mines, viz.: The Research Company, 470 feet deep; the Great Victoria Company, 809 feet; the Flagstaff Company, 817 feet; Annetts & Co., 630 feet; the Williams Company, 635; and the North Williams, 590 feet. These are most of the deepest, and by far the richest mines here, the length of line of reef opened being about 1½ mile, and upon which 110 men are employed.

The Old Hill line of reef.—There are two mines working, the Adelong Company and Prowse and Woodward's Company; there are about 16 men employed, but of the mines I have not been able to obtain any information. On the former a new steam winding and pumping machine has been erected, being the first on this gold field, and good results are expected, the length of line opened being about three-quarters of a mile, and there are several mines on it at present idle.

On the Caledonian line there are at present only two mines at work, viz.,—Trudgen & Co. and the North Caledonian; the former is down 120 feet, the latter 150 feet. There are upon this line 8 men employed.

On the Currajong line there are Williams Company's mine, whose shaft is 225 feet, and the North Currajong; but I cannot furnish any report of the latter, as the company objected to give any information. There are about 18 men working on this line.

Donkey Hill line.—The Excelsior mine have not forwarded any information. Since my last report the Extended Victoria have commenced work; they have passed through the old workings; they are now down 250 feet, and have just struck good payable stone. Hartley & Co. are down 100 feet, and White and party about the same. On this line about 18 men are employed. There are several other claims about to commence work shortly on the field.

In all the quartz mines the lode will average about 12 inches in width, in some places intermixed with slate, in others with granite; but the walls are, as a general rule, well defined.

The general mode for treating the stone is to crush with battery, then pass through Chilean mills; the mundic is then collected, and passed through the buddle, or Denney's Pulveriser. The latter mode is by far the cheapest and most satisfactory; the mundic can be reduced to such an extent that it will flow away with the water, and there is no loss of mercury. There has never been anything in this district to equal the Pulveriser for grinding power.

No pyrites have been treated yet, but from the last crushing for the Victoria Research Company the pyrites were saved by Mr. Wilson's buddle.

Machinery on this Field.—There are 2 crushing batteries with 31 stampers, 4 Chilean mills, 2 Denney's Pulverisers, 2 buddles, 2 steam pumping and winding engines, 10 whims, 11 whip-pulleys, 1 winding engine, on the alluvial, is idle. The value of the winding, pumping, and crushing plant in this district is about £12,000; and I may state that another and I consider the greatest drawback to the quartz mining here is the want of convenience for putting steam hauling or lifting power on the Victoria line. The mines are now almost too deep to haul by horse-power, and as a rule they are very dry, and so high from the water level that it will be long be a very serious consideration.

TUMUT AND ADELONG DISTRICT—GUNDAGAI DIVISION.

(A. W. Armour, Mining Registrar.)

THE mines, both alluvial and quartz, are at a complete standstill in the division for which I act, on account of the scarcity of water. If water was more plentiful many reefs that have been abandoned would be re-taken up, and I have no doubt prove payable. There are no tin nor iron mines in this division. There are parties out prospecting for copper in Jones' Creek, near North Gundagai, and also on the Mooney Mooney Ranges, near Coolac. At both places very fine specimens of copper-ore have been found, but as yet no lode has been struck.

TUMUT AND ADELONG DISTRICT—TUMBARUMBA DIVISION.

(H. M. Langford, Mining Registrar.)

THE only extensive alluvial mining works going on in this Division are three large sluicing claims, opened during these last three years by Messrs. N. N. Gitchell & Co.—two situated on the Burra Creek, and one on the Manus Creek. These are amalgamated claims, on which large sums of money have been expended to bring in a deep tail-race through the rock, so as to enable the claimholders not only to drain the large alluvial flats but to sluice off all alluvial soil, and leave the gold exposed on the rock, to be cleaned up afterwards. These claims have cost on an average £8,000 each to open up and put in proper working order, and although they consist of partially of worked and abandoned ground, yet they return good dividends on the outlay.

On the Burra Creek the gold is found in an alluvial strata of quartz-gravel, which contains also a fair quantity of tin, but I have no means of ascertaining the quantity.

Throughout the district generally mining for the past year has been very slack, owing to two causes: 1st: Nearly all the known payable ground that can be worked by the individual miner in the primitive method generally adopted, has been exhausted; and secondly: A great scarcity of water. Yet, undoubtedly, there is a large tract of country in this district which if properly worked would prove highly remunerative.

I append particulars of the Ournie and Meragle Reefs.

The Nevada Reef, Paddy's River.—Work on this reef has been suspended for some time past owing to the death of the late proprietor of the mining plant. I understand it is the intention of the proprietors to prospect this line of reef in a proper manner, and to start active operations shortly.

Ournie.—The principal mine on this field is on the Peep o' Day Reef, situated on a tributary of Ournie Creek, 4 miles from the river Murray; course of reef, north and south; strike, north, underlaying the first 50 feet west, then to present depth east. Payable stone has been got in the discoverers' claim to the depth of 115 feet. The last crushing from the 100 feet level in this claim went 2½ ozs. per ton; the surface stone crushed 5 ozs. to the ton. The bounding walls for the first 50 feet are soft granite; the rock then becomes hard. Water was struck where the soft and hard rocks met. Width of reef from 2 inches to 2 feet. No. 1 north main shaft down 84 feet; stone not as rich as the discoverers', averaging about 2 ozs. per ton; same general features as discoverers'. No. 2 north main shaft down 113 feet; reef was got from surface to 40 feet level, 2 feet wide, going 4 ozs. to ton. The walls in this claim are hard from surface to 74 feet level, when they become softer to present depth. Last crushing from 80 feet level in this claim, 64 tons, went 3 ozs. to ton. No. 3 north—reef and bounding rock hard from surface; main shaft down 40 feet; vein, 6 inches on average; trial crushing went 7 ozs. per ton; last crushing from shaft and 80 feet level went 3 ozs. per ton. No. 4 north—trial crushing went ½ oz. per ton (8 tons crushed); not payable. At present there are but seven men at work on this line of reef—a tribute party. They have a whim on No. 2 shaft. They hold the discoverers' claim No. 1 north and No. 2 north. This year (1876) they have crushed 129 tons stone for 383 ozs. gold, value £3 6s. per oz. At the present time the tributaries have about 30 tons to grass. The crushing plant is private property, situated about 100 yards below the reef. It consists of a battery of 5 heads, revolving stamps, 7 cwt. each, driven by 10-horse portable engine; table, 20 ft. long, 5 ft. wide; 14-ft. copper plates; blanket-table, 8 ft. long; cost of carting, 1s. per ton; crushing, 12s. 6d. Parties carting from a distance, 10s. per ton is the price for crushing. During the year 1876 the following parcels have been crushed at the above mill:—March 18th—25 tons quartz, Horseshoe Reef; yield, 64 ozs. 15 dwts. gold; value, £2 18s. 6d. per oz. 10th April—32 tons, Isabella Reef quartz; 36 ozs. 17 dwts.; value, £2 per oz. April 15th—8 tons, No. 1 North Horseshoe, for 6 ozs. gold; value, £3 per oz.

July 8th—5 tons, No. 3 north, Peep o' Day Reef, for 6 ozs. 10 dwts. gold; value, £3 6s. per oz. July 15th—5 tons, Isabella Reef stone; 10 ozs. 15 dwts. gold; value, 40s. per oz. October 3rd—New Reef, trial crushing, 8 tons quartz; yield, 5 ozs. 4 dwts. gold; value, 60s. per oz. 129 tons quartz from amalgamated claims, Discoverers' No. 1 and No. 2 north; tribute party; yield, 883 ozs. gold; value, 66s. per oz. 674 tons mullock, from Peep o' Day line of reef, for 156 ozs. gold; value, 64s. per oz.

In reference to samples of stone from the reefs, I have not been able to obtain any as yet. Mr. R. A. Ecclestone, proprietor of the Ournie Quartz Mill, has promised to collect and send me some specimens shortly for transmission to your Department.

New Meragle Creek.—The only quartz line of reef in this locality is the Pilot Reef, on which a number of leases have been surveyed, but little or no work done to develop the ground. No. 1 on the line was prospected some years ago, and a considerable amount of work done. Two tunnels driven from the base of the hill to cut the supposed Reef, but from want of funds and other difficulties work was discontinued for two years. About six months ago the Pilot Reef Company commenced work again, and have been successful in cutting a gold-bearing leader below the line of the Pilot Reef, but parallel to and striking about the same, viz., 6° west of south, and dipping to the west; this, I believe, will unite with the main body at a greater depth. This company have now made arrangements to let this lease on tribute for four years.

Leases Nos. 2 and 3 on the line, comprising 13 acres, more or less, are now in possession of the Pilot Reef Company, who purchased from the original holders of the ground. On the two leases above referred to a very large amount of work has been done to develop these leases, and for two years have steadily continued working until now it is a valuable property. Machinery to the value of £3,500 has been placed on the ground, consisting of pumping, winding, and crushing plant, race and large dam for saving the water and conveying it to the mill for crushing purposes. The underground work is as follows:—Engine shaft, 8' x 4', thoroughly well timbered and centered; two platfs at 50 and 100 feet levels, Nos. 1 and 2. The reef has continued to carry the same strike from the surface to the depth of 110 feet, 6° west of south, and dipping to the west 1' in 7'. At No. 1 level the main adit has been driven along the course of the reef north and south for a distance of 200 yards, and thoroughly stoped to the surface, from which a large amount of gold has been crushed. No. 2 level is now being driven. The reef at this depth is much harder and solid, and a complete change of country has taken place; it is wet and much, more expensive to work. I may add that the gold from this reef is of unusual high standard, being '9689 assay.

The company employs throughout the year from ten to twelve men, besides contractors for delivery of firewood.

The roads between this and Tumburumba are very bad, and of course all the materials made use of for the mine and consumption are very expensive. £500 laid out judiciously would improve this road, and induce a larger population to settle down.

The creek workings, as far as I can gather authentic information, are not now remunerative, from the scarcity of water in this district. A few are now working who have been fortunate in securing water rights; and I think that if capital was invested to send water from the head of some of the rivers which take their rise from the Divide, sluicing on a large scale would pay. There are about twenty men in the district of New Meragle making a kind of livelihood.

TUMUT AND ADELONG DISTRICT—KIANDRA DIVISION.

(P. Smyth, Mining Registrar.)

THE great feature of this gold-field is the immense extent of auriferous deposit existing all along the main range for a distance of fully 30 miles in length by about 8 miles in width, overlaid with floating and solid basalt. This main range has been tapped in several places, within this area, as at New Chum Hill, also Four-mile and Six-mile, on the east side of the Main Range, and at the Nine-mile, the Eight-mile, the Fifteen-mile, &c., on the west side of the range. Exactly the same deposit is found in all these localities, and on every spur coming from the Main Range, on either side. The formation in every instance is as follows:—

- No. 1. Basalt floating or solid.
- „ 2. Alluvial.
- „ 3. Coarse sand.
- „ 4. Clay.
- „ 5. Lignite, 30 feet thick.
- „ 6. Pipeclay, 20 feet thick.
- „ 7. Wash-dirt, 20 to 50 feet thick.

This wash contains more or less gold distributed all through it, with heavy deposit on the bottom. The wash is composed in the main of quartz pebbles, and what the miners call "Floating Reef"; the true bottom generally speaking is a soft yellow slate. The present face of the "Empress" at the Nine-mile is fully 130 feet in depth, about 50 feet of which is wash-dirt. There can be no doubt but that if permanent water could be brought to bear upon these immense deposits, Kiandra would become one of the greatest gold-fields in the world. The extent of country where this deposit is known to exist is fully 200 square miles in extent, would last for ages. Owing to the scarcity of water here a company was formed for the purpose of crushing the wash, but this process did not pay. This very same ground is now being operated upon under the ground sluicing process, and pays 20s. per day to every man employed during the time the water lasts. Notwithstanding, the stripping is 80 feet deep before reaching the wash, the whole of which is (including the lignite) removed by water many

of the best sluicing claims here did not get more than six weeks water this season. Consequently the returns in many instances were below the average, as in most seasons the water lasts ten or twelve weeks. The majority of the sluicers here work their claims while there is water, and when none, follow some other occupation. With a very moderate outlay the head waters of the Tumut could be brought to bear upon this deposit, and until this is done Kiandra will not advance. Working three months, and lying idle nine months, will never do. Parties of Chinese are still working the "Old River Bed" and making good wages. Quartz reefs, of which there are a great number known to be auriferous, are at a stand-still, with one exception. The water level on the tops of any of the ranges about Kiandra is reached at 30 feet, and without pumping machinery the reefs can never be developed.

The Three-mile Reef is from 2 to 4 feet wide, and as far as taken out gave 19 pennyweights to the ton, a splendid return considering the great body of stone, and the ease with which it can be raised. The hanging wall and foot-wall on this reef is respectively slate on the one side and sand-stone on the other.

The Charcoal Reef, which is at a stand-still from the excess of water, is very rich, and averages about 1 foot in thickness. The last ton of stone crushed from this reef at the 50-feet level was operated upon by Mr. Watt, of Sydney, and gave a return of 6 ozs. 3 pennyweights of gold. Amongst others can be named the Whipstick and Surface Hill Reefs, both of which are very promising.

The population remains at a stand-still, neither increasing or decreasing.

The yield of gold can hardly be got at when there are so many Chinese, as they will only sell sufficient to pay their way. However, I believe, a better average is made here than upon any other gold field in the Colony. I estimate the yield for the year 1876 at about 1,544 ozs. Average value, £3 14s. per ounce.

Copper—Large deposits of this mineral are known to exist in various localities in the neighbourhood of Kiandra, but owing to the mountainous nature of the country, is little sought after. This mineral is also found in various parts of the Manaro District away from the main ranges. Sluicing must ever be the great feature in the working of the Kiandra Gold Field, and until water is available, little advance can be made.

TUMUT AND ADKLONG DISTRICT—QUEANBEYAN DIVISION.

(O. Willans, Mining Registrar.)

REFERRING to your letter of 29th ultimo I have the honor to hand you a return sent me by Mr. Wickes, the manager of this Company; with the exception of the price he puts on the gold I have reason to believe the other parts of his statement correct. Up to the end of last year I understand four men would be all that are at work there. Mr. Wickes, however, states, that as they consider the reef very remunerative they will soon put on a great many more men. It is curious, however, that previous trials on this reef did not amount to more than $\frac{1}{2}$ oz. to the ton.

The return sent includes all the machinery at present at work on this reef; for all other parts of my district there is nothing but a nil return.

PEEL AND URALLA DISTRICT—ARMIDALE DIVISION.

(Edward Marriott, Mining Registrar.)

IN compliance with instructions, I have the honor to forward a report of the mining industry in the Armidale division of the Peel and Uralla District for the past year.

2. Mining in the immediate vicinity of Armidale is confined to very few places, the only localities worthy of mention being Boro Creek, Cameron's Creek, and Puddledock. Attached hereto are returns specifying the various claims in these localities, and particularly as far as can be ascertained from the miners themselves, of the operations of the past year.

3. **Boro Creek**.—Situate on Mihi Creek Run, distant about 28 miles from Armidale. There are a few diggers (some six or seven) working old and abandoned ground in this locality; this they are however only enabled to do after wet weather, the rest of their time being occupied in cultivation, shearing, splitting, &c.

On a reference to the returns mentioned, it will be observed that the amount of gold obtained from the few claims at Boro Creek amounts to not more than 30 ozs., the value of which in Armidale ranges from £3 14s. 6d. to £3 15s. 6d. per oz.

4. **Cameron's Creek**.—Situate on Gyra Run, and distant from Armidale about 12 miles. Early in 1873 Messrs. Gallagher, Kennedy, Barry and party, took up a prospecting claim on a reef described as the Home Rule; almost immediately afterwards a number of leases were taken up on both sides of the prospectors on this reef; the prospectors continued working for some time; in fact, have been doing so on and off ever since, but the holders of the leases with one or two exceptions have in point of fact deserted them.

5. In September, 1874, the Messrs. Gallagher (blacksmiths of this town) erected a crushing-machine (5-head stamper) at a cost of about £900, since which time only two or three crushings have taken place, the quantity of stone crushed amounting to about 53 tons, from which about 62 ozs. of gold were obtained.

6. During the past year there were about 14 tons of stone raised from a shaft on leases Nos. 14 and 15 west of the prospectors' claim, 12 tons of which was crushed, yielding nearly 20 ozs. of gold, the value according to the returns from the Sydney Mint being £3 17s. 10d. per oz.

7. Gallagher and party are the only persons working at present, and they are now advertising for tenders to raise from 100 to 500 tons of stone from their lease.

8. *Puddledock*.—Situate on Spring Mount Run, and distant from Armidale about 12 miles. From information received from miners in this locality, I have ascertained there are about nine diggers working sluicing claims on old and abandoned ground, and some three or four Chinamen; they are however only able to work after wet weather, and the quantity of gold stated to have been obtained for the past year amounts to from 140 to 150 ozs.; the value of this gold in Armidale averages about £3 14s. 6d. per oz.; Sydney Mint, £3 16s. 3d.

9. I am indebted to the Bank managers and storekeepers of this town for particulars as to the quantity of gold purchased by them during the past year, but for obvious reasons they do not wish their transactions to be published in detail.

PEEL AND URALLA DISTRICT—NUNDLE DIVISION.

(*Samuel Kermode, Mining Registrar.*)

Alluvial.

I HAVE nothing to report concerning the cement lead at Mount Misery, no work having been done since my last year's communication.

On the same lead at the Hanging Rock, Mr. Robson & party has put in a level of several hundred feet, well timbered, with several cross-cuts, and although he gets upon some small patches he is not yet sufficiently into the hill to strike the cement lead.

In Oakenville Creek, at the rear of Mr. Kermode's flour mill, a large party (13) of Chinese are at work taking the creek in a face, some 18 feet deep. I cannot ascertain what gold they are getting, but have reason to believe they are doing well. Some few hundred yards higher up the creek a party of Chinese are stripping a point, taking it in a face also, sluicing when they have sufficient water.

I do not know what gold they are getting.

Another party of Chinese are at work just below the junction of the creek with Butcher's Gully, only lately opened.

Just below the Police Camp, near the foot of Oakenville Creek, a party of (13) Chinese are sluicing and getting good wages; depth of face about 20 feet.

Not any one working in Spring Creek, Happy Valley.

In Happy Valley Messrs. Hitchens & party are taking up a long race beautifully timbered through the old ground; they are already up about 600 feet and expect to go 400 feet more before they get to the ground they are trying for, and I have good reason to think that they will have a splendid claim, as the ground above could not be properly worked before on account of the great body of underground water that had to be contended with.

Messrs. Powell & party are working higher up with varied success.

In the gully running parallel with the new road to the Hanging Rock, two parties have bottomed at about 30 feet on payable gold; they have not yet had a washing up, but are stacking their dirt until they can get water.

At Harden's Hill, on the Hanging Rock, two parties are at work and earning good wages.

There are two parties of Chinese box-sluicing in Swamp Creek, earning wages.

At Bowling Alley Point, on the Government side, only a few parties are fossicking in the bed and banks of the river, the ground being mostly worked out. On the opposite side of the river, on the estate of the Peel River Land and Mineral Company, there are several parties at work. I am informed a party of Chinese struck a good patch a short time since—some 50 ozs.—nearly opposite Mr. Lindsay's stores. From the information I obtained from storekeepers and others I estimate the quantity of alluvial gold now in this division at about 1,500 ozs.; average price, £3 12s. 6d. per oz. As far as I can ascertain the quantity of gold won from quartz reefs in this division, including the reefs on the company's side at Bowling-alley Point, is about 1,200 ozs., making a total of about 2,700 ozs. of gold won in this division.

Quartz.

The Nundle quartz reefs have not been worked since my last report, neither has the antimony lode.

The Wheal Proper Reef, at Foley's Folly, managed by Mr. John Stanning, raised 666 tons of stone during 1876 which yielded 125 ozs. of gold, valued at £449 3s.; depth of deepest shaft, 435 feet; width of vein, from 4 to 6 inches; dip to the west, at an angle of about 55°, bearing south-east by north-west; the tailings from the battery are being saved for further treatment, as they have not at present any appliances for treating pyrites.

Mr. Jarman's lease on the same line of reef has been prospected, but with no result worthy of mention.

The Swamp Creek Reef, between the Hanging Rock and Foley's Folly, has been prospected by Messrs. Bond & party; they raised 51 tons of quartz, which yielded 78 ozs. gold; value, £286 13s.; depth of deepest shaft, 50 feet; width of vein, 4 inches, dipping to the west, bearing north and south.

All the reefs on the Government side at Bowling Alley Point are standing as in my last report, excepting two claims being prospected by Mr. J. P. Robertson and Mr. J. Trevena and party, on cancelled lease, Foley's Reef. I cannot hear that any gold has been obtained yet.

The Marquis of Lorne, on the Company's side, Bowling Alley Point, the property of Messrs. Lindsay, Robertson, and Stratton, has been extensively worked to a depth of 400 feet or more. I cannot ascertain the quantity of gold won, as the mine-owners object to give me any information, but I hear it is paying very handsomely—as much as 12 ozs. to the ton. The gold obtained from this claim during last year (being I believe some hundreds of ounces) was carried either to Sydney or to the bank at Tamworth by the mine-owners.

Machinery.

The ten-stamper fifteen-horse-power engine, at the Mount Misery Cement Lead, has been idle for the last twelve months.

The Wheal Proper Co.'s Crushing Machine, four stamp-heads, worked by an overshot water-wheel, with a counter balance water-winding machine, over the deep shaft, has been at work during the last year, as also has Mr. Bond's overshot water-wheel crushing-machine, four stamp heads, at Swamp Creek. And Mr. J. P. Robertson's overshot water-wheel machine, four stamp-heads, at Bowling Alley Point.

The other three crushing machines, viz.:—The Opossum Co.'s (steam), ten stamp heads, fifteen horse-power; the Tamworth Co.'s (steam), ten stamp heads, same power; and Mr. J. Fuller's overshot water-wheel machine, four stamp heads at the Moonlight Reef, have all been idle during the last twelve months.

Estimated value of machinery and plants in the Nundle Division of the Peel and Uralla Mining District, from £7,000 to £8,000.

Estimated number of men engaged in mining in this division during 1876, 180, a goodly proportion being Chinese.

From what I can gather in my journeyings about the diggings in conversation with old miners and residents, there is plenty of ground that would pay well in this district, if properly prospected, and capital could be procured for that purpose.

Many reefs have been found, just opened, gold got, and then abandoned for want of means to sink to a lower level.

Antimony Lode.—Concerning the antimony lode at Nundle: This lode varies in thickness as far as it has been opened; the thickest part which I have seen opened is about 4 inches solid antimony*; it is pinched out to nothing in other parts. The deepest shaft which has been sunk in this lode is about 15 or 16 feet, and opened about 40 feet at that depth. It is hard to say what the lode may be like deeper down.

PEEL AND URALLA DISTRICT—BARRABA DIVISION.

(John Flanagan, Mining Registrar.)

I FIND it impossible to give a correct estimate of the quantity of gold won in my division. Some parcels are sold to private individuals, some to the banks, and some to the storekeepers, while many of the miners retain large quantities in their hands. During the past twelve months about 50 men have been working, or I may say prospecting and searching for gold in this district, not remaining more than two consecutive months in any one place, and two-thirds of them follow other occupations during the summer months, such as shearing, reaping, &c.

PEEL AND URALLA DISTRICT—BINGERA DIVISION.

(Michael Doyle, Mining Registrar.)

THERE is no improvement in gold mining to report during the past 12 months. There are but very few working on the gold-fields in this division at present, and a general dullness prevails. In copper mining matters are looking better, and I trust ere my next report that a good copper mine will have been opened to advantage. A Mr. Johnson recently arrived from Sydney, has secured from the original lessees the Bobby Whitlow copper-mine, and intends to develop it immediately, and in the course of a few months its value will be tested.

PEEL AND URALLA DISTRICT—TINGHA DIVISION.

(Thomas Jones, Mining Registrar.)

I HAVE the honor to intimate that I am not in a position to give detailed accounts of all the workings in my division, but submit general information such as I am at present in possession of through past experience on these tin-fields and information afforded me by those interested in the successful development of the tin-mining industry.

In opening my report I may first mention, the progress of the mineral resources of this division have been much retarded by the evident want of practical mining arrangement, and the too apparent folly of having mining managers during the "mining mania" of past years placed in control of valuable mining properties in some cases, and more frequently of properties where the probability of tin never existed, and of paying these officers high salaries. Thus funds were exhausted, companies wound up, and general confidence broken, which has had disastrous effects upon tin mining in general to the present day. When this confidence is restored we may yet anticipate a bright prospect from the unlimited resources of this district, where rich payable deposits are known to exist, but yet remain undeveloped for want of capital and enterprise.

During the past year several rich discoveries have been more fully developed and are still yielding handsome returns. Amongst the most prominent of these are—

Messrs. Martin and Irwin's, and Woods and Brickwood's claims.

These deposits belong to the miocene period. The upper part of the formation consists of sandy concretionary ironstone. Underlying the ironstone are red and white sandy clays, and beneath these water-worn drift, in which there are extensive deposits of tin ore. The deepest sinking at present on these claims is about

* NOTE:—The ore is antimony in combination with sulphur, and when heated gives forth a strong sulphureous smell, and even shows a blue flame.

60 feet. The ground is all worked on the tribute system (with one exceptional instance, where the deposits are very rich and shallow) by small parties; consequently the method of working adopted is of the most primitive kind, and necessitating the smallest possible outlay of capital, the only machinery employed being a wooden windlass and a green-hide bucket. Some of the wash-stuff yields as much as 8 cwt. to the load. There are extensive tracts of similar country in the district that have not been prospected owing to the inertness of proprietors or those who represent them. The prosperity that would inevitably result upon the more extensive opening up of the tin deposits that exist in this locality is thus indefinitely postponed.

COPE'S CREEK.

Many of the richest claims have become exhausted, but there are at present five parties working with very satisfactory results. In one claim a party of Chinamen are working on the west bank of Cope's Creek. The wash-stuff consists of coarse yellow sand and water-worn pebbles, and is overlaid by about 12 feet of water-worn gravel, and sandy ferruginous clay, above which again are 2 feet of light sandy loam. This party is working on tribute under the management of Mr. D. Grove. Further down the creek is a large party of tributors working a block of ground purchased by the "Union Tin Mining Co.," which is at present yielding about 10 tons of ore per month. An eight-horse portable engine is in active operation, and the working is carried on and materially assisted by the aid of horses and drays. I may here mention that adjoining this claim a party has just suspended operations, who, during a period of twenty-two months, extracted about 380 tons of tin ore, averaging 73 per cent., and there is every probability of the present workings in this adjoining claim producing the same satisfactory results. A few hundred yards lower down the creek are two more parties working.

P. Wright's Claim.—A large party of men have been actively engaged in this claim, and I learn from the untiring efforts of its able manager, Mr. J. Billin, that a very satisfactory result is obtained, and that the yield has been for a considerable period, from 10 to 15 tons per month. The machinery employed in this claim is precisely similar to that in the Union Tin Mining Company's. Adjoining this claim is another property, belonging to the same proprietor, worked by a party of Chinese, with the aid of an engine; the yield I am informed is about 10 tons per month. Lower down the creek is a claim known as "Yank's". This very desirable and valuable property belongs to Capt. E. G. Swinton, and has been in active development for upwards of two years it has proved one of the most valuable properties on Cope's Creek. From this claim, which is still working, and others, which have become exhausted, the proprietor has received upwards of 200 tons of tin ore during the past year; an eight-horse power portable engine and wheelbarrows are the only appliances used in developing this claim. There are a few parties engaged at intervals, extending for about 12 miles further down the creek; but although the workings at present are very diminutive, I have every reason to believe, owing to recent applications now pending, that I shall be enabled to chronicle more important workings ere the expiration of the present year. Some two years ago, owing to the extensive workings in the neighbouring claims surrounding Capt. E. G. Swinton's, the township of Wrighton was formed, but owing to those workings having now become exhausted this township is reduced to a few inhabitants, a store, and one public-house. Also, the township of Kimberley has made a decidedly retrograde movement; the post office has been removed, also the public pound—an extensive store entirely collapsed—consequently the entire desertion by inhabitants has followed. Both these townships have severely felt the vicissitudes of mining industry; but to counteract this effect the important discoveries referred to at the commencement of my report are of a less exhaustive description, and it is difficult to predict to what extent these rich deposits of tin, traversing through red or volcanic country, may yet be traced. That these discoveries eclipse all that has ever yet been found in my Division is a certainty; that they have only been developed within the last few months is also another fact; therefore, the gloomy forebodings of some have little weight with me. I may here mention, on reliable authority, that one or two parties of tributors have been turning out ore, enabling them to clear £11 per week a man, clear of expenses. Much more of this country (as I before mentioned) exists for future prospecting, and the presence of a deep stanniferous lead, yielding such returns, surely must induce capitalists to enter the field; but unfortunately the injurious influence on the tin-mining industry, caused by the floating of valueless mines, is still seriously felt, and until some more active measures are resorted to, it may take years to dispel the apathy that now exists amongst the mining community. I learn that in Victoria instructions are sent to the Wardens in the outlying districts to proceed with the expenditure of a vote of £10,000 for prospecting purposes. Whatever sum could be devoted for such a purpose in this district I am sanguine would soon prove reproductive.

Stony Creek Mine.—This valuable property has recently fallen into the hands of one of the most enterprising firms in the district, consequently great results are anticipated. Under the management of Mr. D. Grove a tunnel has been driven into a hill consisting of basaltic trap overlying the bed of an ancient watercourse; the width where the tunnel is situated being 150 feet, the stanniferous deposits have an average depth of 2½ feet, and consists of white sand and angular fragments of quartz, varying in size from that of a walnut to much larger proportions; the tin is in exceedingly fine granules, and has a grey appearance. This hill forms one of a chain of hills extending for several miles in a north-easterly direction. There have been several tunnels driven into the adjacent hills, in all of which stanniferous deposits exist. The work hitherto has been carried on by Chinese, who, for want of experience in underground work, did not secure the ground properly, the consequence being, in most cases, their workings caved in before they reached the best of the wash. Under the management of the present proprietors operations are carried on both extensively and systematically, trucks being used to supersede wheelbarrows. The prospects prove the wash stuff to be highly payable, and there is every probability of its proving a

highly profitable speculation. This mine is situated about 2 miles in an easterly direction from Messrs. Brickwood and Woods', first described in this report. About equi-distant from either of these properties a number of Chinese and Europeans are developing highly payable ground, but being back ground and not having a continuous water supply, these properties are not worked to the same advantage; also, the ore is of a much lower per centage—averaging about 61 per cent.; nevertheless this ground has been working for a considerable time with very satisfactory results, and during the past year I learn, from tin buyers, has yielded at a fair estimate, about 300 tons of ore. Owing to the ground being worked by Chinese it is difficult to check these results; but coming from gentlemen of undoubted accuracy I accept the return as reliable. This run or lead is likely to continue unexhausted for a considerable time, and as mineral areas from time to time are applied for in this locality there is every probability of fresh discoveries taking place. The prospectors are men of known ability and undaunted enterprise, never yielding in their researches but overcoming slight obstacles. Such men as these are invaluable to our tin fields, and worth a gross of monopolisers, who lock up the land for speculative purposes only, and live hundreds of miles away from the scene of their speculations.

The Black Angel is situated at the eastern extremity of all present workings (commonly known as the Red Hill). This mine has been working during the last four years, and from its isolated position I cannot give it that prominence that I have every reason to believe it justly merits; under the management of Mr. Lane, its proprietor, it has long continued to yield payable results. A tunnel has been driven into the centre of the hill to a considerable extent, and some eight or ten miners are satisfactorily engaged in developing the same, the yield at the present time being about one ton per month. In the surrounding neighbourhood there are several well defined reefs, also numerous deposits of alluvial surfacing, which is not considered at the present time payable. Adjoining Mr. Lane's property is the Bismarck Mine, which is another property of equally promising appearance; it has a tunnel driven into the hill for 100 feet; there operations have ceased for a considerable time, owing to the need of machinery. North, east, south, and west of these claims small parties have from time to time prospected the ground and worked the same, but with no satisfactory results, and in many cases their operations were attended with a loss.

The Britannia Mines embrace an area of 500 acres, 240 of which are under application for mineral conditional purchase, and include the present township of Tingha. A large extent of surfacing, varying in depth from 12 to 18 inches, has from time to time been worked out by tributers with satisfactory results. The creek workings, which have been vigorously prosecuted on Darby's Branch have resulted in the extraction of stanniferous deposits, varying from 6 to 18 inches; the alluvium deepening from 12 to 15 feet, as the deposits extend into the banks and flats. The average number of miners engaged as tributers during the year is estimated at between 35 and 40. The yield of tin I include in the gross total, which will be found near the conclusion of my general remarks. The development of the resources of this property was considerably retarded during the latter part of the expired year by the unpropitious season; the drought that prevailed throughout the district causing a complete suspension of washing and sluicing operations on the surfacing blocks; also, the yield of tin was materially affected by the creek workings becoming exhausted in many of the most productive claims.

Numerous small leaders and reefs exist in close proximity to the township of Tingha, and in one instance an abortive attempt was made to develop the same, but was finally abandoned at a depth of 50 feet. The present manager, Mr. Moore, who is ever watchful in furthering progressive movements for the advancement of this rising township, sanguinely anticipates that the Britannia Tin Reefs, at present undeveloped, will, with the aid of powerful stampers, prove most valuable.

Middle Creek.—From these mines I have been able to gather but little information, but may state that owing to the want of capital and enterprise this once much valued locality has remained for a considerable time in a complete state of stagnation. The once extensively worked Stannifer Mine has entirely collapsed, and affords no labour to either tributer or wages men. Lower down the creek is situated The Elsmore Company's property, which was disposed of with a most costly plant some few months ago for a sum little exceeding £1,000. There still remains half a dozen tributers who dispatch their products direct to Sydney (say 10 tons). Situated on the head of the creek is Wheeler's Saw-mill, driven by an eight-horse portable engine; this mill forms a great acquisition to the general community, being kept in constant work; it affords employment for about six men. In the neighbourhood of Joe's Gully a party has been working for a considerable time. There are also some prospectors in this direction who have recently taken up prospecting areas, and as I am informed large formations of basalt are in this locality I am daily expecting to hear of fresh discoveries.

Long Gully Mine, under the management of Mr. Grove, and being the property of the Union Company, is situated below Reeves' Reef, and extends 1 mile and a half in length, and joins the upper watershed of Sutherland's water, the stanniferous deposits of which have always commanded the highest price in the district, with one or two exceptions. Mr. Grove made several unsuccessful attempts to open this land in the early days of the tin field, by offering high tribute, tools, and assistance, but the gradual decline in the price of tin ore sickened all parties interested. Recently Mr. Grove has made great efforts to develop the same, and has by the expenditure of labour and capital been successful in finding a lead of coarse water-worn ore of first quality. The lead is about 15 feet in width and 3 feet in depth, and prospects from $\frac{1}{4}$ a pound to 5 lbs. to the dish. A tunnel has been driven into the centre of the leads a distance of 120 feet, and operations are commenced to block out the wash-dirt which may be fairly expected to yield about 2 tons per week for every twenty men employed.

This gully will be worked in sections now that the lead has been discovered, and the indefatigable manager will have no difficulty in securing tributers for the remaining portion of the undeveloped blocks which have been lying dormant for past years.

The Bolitho, a very valuable mine, also partly owned by the Union Company, has been closed since Messrs. Beilby and Scott surrendered their title and interest. It is partly owned by Messrs. Amos Brothers in conjunction with the Union Company, and being one of the most valuable discoveries in lode tin yet made in my division it is confidently expected that, as a crushing plant, the want of which materially retarded operations, has been supplied by the spirited proprietors Messrs. Watt, Stewart, and Grove, work will be recommenced, and I hope shortly to report favourable results.

The Lodes.

Many very promising lodes have been discovered, but are not working owing to the scarcity of water for crushing purposes. There is one crushing plant in the district, situated at the crossing place of Cope's Creek, near the township of Tingha. It consists of a five-head battery, driven by a 12-horse power portable steam engine, and has dressing floors arranged on the Cornish principle, but not on a very elaborate scale, the lodes not having been sufficiently developed to induce the manager Mr. D. Grove to erect a more costly dressing plant.

The Bolitho Reef is one of the most extensive yet discovered in the district, but for the reason already stated has been lying dormant for a considerable period.

Other lodes have been discovered in various parts of the fields, but owing to the alluvial deposits proving more attractive have failed to be dealt with.

General Remarks.

I desire to state that my report, although hastily compiled, has been carefully prepared with a view to guard against exaggeration. That the quantity of ore won is some 726 tons in excess of that of the preceding year is in a very great degree due to the unprecedented drought and complete immunity from floods; this has invigorated the managers of the various companies on the main creek, and induced them to place a much larger number of men than would otherwise have been employed. With praiseworthy efforts the tin has been extracted, and as I mentioned in my report the claims in this particular locality exhausted. The last July rains also tended to greatly swell the amount of ore raised, as it gave the back blocks an opportunity of washing up stacks of wash-dirt that had been collected, in some instances, upwards of nine months. During the past year 117 licenses have been issued, and 2,400 acres have been re-applied for under mineral lease; the mineral claims at the extreme south-east of my division are being rapidly developed with satisfactory results, while those in the vicinity of Tingha, within a radius of a mile, have yielded most unprecedented returns, and much ground still remains to be opened up.

Since my appointment as Mining Registrar, in October last, I have failed to find time to devote to the personal inspection of the various claims working at remote parts of my division. In order to give an idea of the extent of my division, taking the windings of Cope's Creek, it extends from east to west about 25 miles (workings at both extremes being now carried on) the opposite cardinal points about 16 miles. I make these remarks to show how futile must be the efforts of the few miners, who number about 500, inclusive of 300 Chinese, to satisfactorily prospect so large an area. The richest deposits now existing were discovered purely accidentally: The discoverer was disgusted with tin mining, and the industry proved distasteful and unremunerative when he selected a red volcanic formation for agricultural purposes; upon sinking a waterhole his prospects were changed, the land re-applied for under mineral regulations, and there is every reason to believe the claim will prove remunerative for years.

The right of "authorities to select" have been exercised much during the past year to the detriment of the *bona fide* miner. These rights have no doubt been purchased judiciously for sums varying from 8s. 6d. and upwards, and have been used in selecting what I may term the cream of mineral forfeitures. If upon re-application these areas were worked much good would have accrued; but, on the contrary, they are again locked up for speculative purposes only, pending the refusal of the applications.

Except in few instances, where six portable engines are engaged, sluice-boxes, horse-drays, Californian pumps, wheelbarrows, wooden windlass, and greenhide buckets, constitute the plant used throughout the fields; but when more modern appliances are brought into the field to develop our resources, the immense wealth yet to be disembowelled in this immediate vicinity will prove the tin-mining industry of incalculable value, and with increased facilities for carriage in the extension of railway communication (which is indicated by surveys passing through our midst) it will become the most important industry in New England.

We have one firm—Messrs. Watt, Stuart, and Grove—making great exertions to develop the mineral resources of the district; and it is not unlikely, when the results of their enterprise become more widely known, confidence will be restored and other firms enter the field. I could name many cases where parties have left the tin fields in a comparative state of affluence, gained by steady prosecution of the tin mining industry, and many still remain upon the field accumulating wealth.

The present Regulations relating to mineral licenses apparently work badly here. If the surveyor has to proceed with his staff to a remote part of this Division his fee would not pay his expenses. Again, a forfeited area of 20 acres can be re-applied for without survey fees. This saves the applicant much future trouble, and he receives a larger area at but little extra cost. Want of survey sadly retards the present development of these fields, proprietors not being willing to push forward their operations and make much progressive movements until their titles are secure.

The quantity of ore raised has been carefully collected from the most reliable sources. I have also used means in checking these important statistics, and I am convinced I am a little below the just return, because owing to certain producers and buyers having left the district I have been unable to include their quantities in the return.

2,300 tons being the gross yield of the claims in this Division, makes the return just 646 tons in excess of last year; the number of miners only I compute at 500. In round numbers this includes 300 Chinese. Mr. Grove is now in need of experienced miners, and as other wages men have recently been engaged on the shallow but rich deposits of Messrs. Martin and Irwin, the number of miners is on the increase.

During the forthcoming week I will endeavour to collect a few samples of ores, &c., and forward the same to the Department of Mines.

PEEL AND URALLA DISTRICT—BACK CREEK DIVISION.

(*P. J. Langworthy, Mining Registrar.*)

THE number of miners working on Back Creek is about fifty. There are five quartz reefs, worked by fifteen men; depth of shafts from 15 to 35 feet. Particulars of three reefs supplied by accompanying forms. The remaining two reefs are only in the course of sinking.

The men employed in getting gold otherwise than reefing are working in the bed of the creek. Mode of working, by sluice-boxes; depth of wash dirt, from 1 foot to 2½ feet, and from 2 feet to 4 feet wide. Wash dirt consists of gravel and boulders. Quantity of gold won on Back Creek, from the first rush to the present, about 1,500 ozs.

This report is up to 31st December, 1876. The report would have been sent in before but I have had the greatest difficulty in getting the storekeepers to give the desired information. I will endeavour to supply you with fuller information in a week or two, and also a sketch of the locality and lay of Back Creek.

PEEL AND URALLA DISTRICT—NOWENDOC DIVISION.

(*Thos. Laurie, Mining Registrar.*)

I HAVE the honor herewith to lay before you a short report in connection with the diggings in this neighbourhood.

In the first place I beg to state that the present diggings are confined to a portion of the Cooplacarripa River and two or three tributaries thereof, and may be termed alluvial diggings. The gold is procured in the usual way, sluicing, &c., while some parties have gone to a good deal of trouble in bringing in large heads of water for ground sluicing purposes, and which is by far the best way of saving fine gold. I may also mention that the wash in which the gold is found consists of stiff red clay, mixed with quartz, and very hard to dissolve, which can be done only by puddling; this is the most effectual way of treating the clay, as it is thus brought under the action of the water. The gold varies from the finest scale up to nuggets of from 10 to 12 ounces. I may also inform you that the diggings are just now at a very low ebb, caused by rushes to other places, and the sheep-shearing season; also, that last year's season has been a very dry one, which interferes very much with alluvial diggings.

However, I believe at no very distant date the place will revive again, as there is a great deal of country in this locality that has never been prospected, and that has all the appearance of gold-bearing country.

I may also state that the present diggings and adjoining country consists mostly of slate and quartz formations, in most instances overlaid with trap or basalt rock. Large reefs of the finest ironstone are also visible; and copper lodes cropping up to the surface of the ground.

Up to this time there has not been any payable quartz reefs found, although one party is now trenching and cross-cutting for one, and is very sanguine of success, many splendid specimens having been found in the neighbourhood, pieces of quartz 4 and 5 lbs. weight giving when crushed a return of 3 and 4 ozs. of clean gold.

From information received from those at work I find the average earnings of the diggers is about 40s. per week.

In conclusion I beg to remark that very many of the present diggers are not a prospecting class of people, indeed half of them may be termed a rambling lot of swagmen, knowing very little about gold digging or any other kind of work.

PEEL AND URALLA DISTRICT—WALCHA DIVISION.

(*C. B. Airey, Mining Registrar.*)

IN this division there has been but one claim worked on the Glen Morrison Field, viz., the Golden Bar Reef (quartz), for the last six months, but at the early part of last year the No. 1 claim was tried, and a small quantity of gold obtained, certainly not more than 70 ozs. This I have not mentioned in the tabulated form on the other side, as I could get no certain information regarding it; in fact when visiting Glen Morrison Gold Field I could see no one who could give me the required information. With regard to the quantity of gold obtained, that information was gained from the manager of the Bank. I have visited the mine now working (Golden Bar Reef), and believe there is plenty of gold to be obtained, but I fancy there is a want of capital; they never have more than five men working, but their average for the past year was four; there are only two or three men who have worked on the claim from the first up to the present time; there have been many changes among the workmen. The 321 ozs. of gold obtained from the Golden Bar Reef was from two crushings. I saw some very fair specimens at the diggings, but that visit being my first I was not quite capable of judging the value of the gold obtainable from these specimens.

NEW ENGLAND AND CLARENCE DISTRICT—VEGETABLE CREEK DIVISION.

(George H. Gower, Mining Registrar.)

I DO myself the honor to forward for your information my Report on the Tin Mines situated in my Division for the year 1876.

It is to be regretted that the yield of ore from the Vegetable Creek Mines is not so great as in 1875, but still the amount raised of 3,008 tons 14cwt. for 1876 is very satisfactory.

The very rich deposits in the bed of Vegetable Creek, which have been worked with such remunerative results, by the eleven mines situated along its course of $3\frac{1}{2}$ miles, and from which the large amount of 6,252 tons 12 cwt. has been raised from the commencement of mining operations in 1872 to the 31st December, 1876, is now all but worked out; the leaseholders have had to direct their attention to its adjacent banks and flats, where a remarkable feature worthy of note is the discovery of leads or runs of wash, rich with ore, far away from the creek bed, and quite distinct from it. This is most important, for it makes the value of most of the holdings. It is particularly to be noticed at the Great Britain, Little Wonder, Moore and Speare's, and Rothschild's mines, where all the washdirt is now being driven out, this method being found more economical than stripping paddocks as heretofore, as in these cases the deposit of payable dirt lies at a depth of from 8 to 12 feet, under very hard ground, which would otherwise require the use of blasting powder.

In some measure the low yield of ore from the principal properties on Vegetable Creek is to be accounted for by the severe drought which this district suffered during the early part of the year, but still there is no hiding the fact that the shallow workings in the creek bed are being gradually worked out, as will be seen by comparing the yields of 1875 and 1876 from six out of the eleven mines working along Vegetable Creek. Moore and Speare, Baal Gammon, Nonpareil, Rothschild's, The Six-mile, and Gordon's, returned 1,007 tons of tin in 1875, while during 1876 the amount raised from the above-mentioned mines was only 595 tons, which shows a decrease in the yield of 412 tons. However, should the tin market rise, there is still a large quantity of ground, now left as unpayable in nearly all the mines, which would be worked with very satisfactory results.

The Great Britain Tin Mine, however, is the only exception in this division of having this year exceeded last year's yield, having raised 547 tons as compared with 431 tons during 1875.

This result is not due to the increased richness of the deposits, but to the large amount of wash operated upon daily, and to the facilities and improvements in sluicing at the three points of operation.

A new machine for sluicing for tin, both by steam and horse-power, has been erected during the last year on this mine, which, for its usefulness and ingenuity, reflects the greatest credit on its constructor, Mr. W. H. Wesley.

The following is a description of it. The diagram referred to will be found at page —:—The washdirt is tipped into a hopper A arranged for its reception at the end of the cylindrical sieve B (10). If motive power and water are in command and a cistern placed over the sieve to get a pressure of water to fall on the dirt it will cause the same to be washed into the cylindrical sieve direct. From this cistern are pipes (a) which convey spouts of water to fall against the sieve, and wash off all the loose tin ore that might be on the pebbles.

If worked by horse-power to economise expense of lifting water, the water can be conveyed (as per diagram) to wash the dirt into the sieve, and the revolutions of the sieve being against the water, in a revolution or two the stones are washed thoroughly clean and fall into the bin, and all the fine sand and tin ore conveyed into the machinery to be separated.

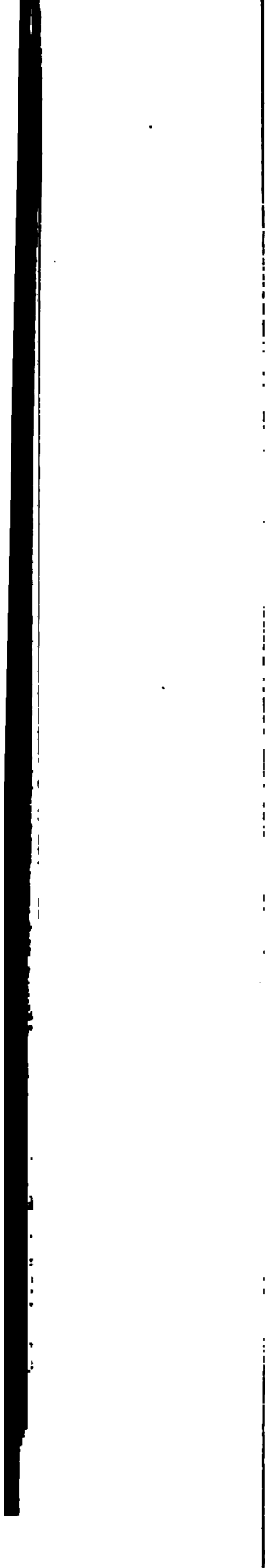
A cylindrical sieve B (10) 3 feet long and 1 foot 6 inches in diameter, composed of bars of iron $\frac{3}{4}$ ths. round and $\frac{1}{2}$ of an inch between each; these bars are longitudinally with the sieve. This sieve has two centres on an inch axle, and connected to the belt pulley by a Hook's joint; this is required to keep the belt pulley level; the sieve is set on an angle of 4 inches in the whole length.

At the receiving end of this sieve there is a flange $1\frac{1}{2}$ inch high within to prevent pebbles or stones from falling between the sieve, and the side of the structure and into the machinery. At the discharging end there is a flange on the inner side ($1\frac{1}{2}$ inch high) to prevent the pebbles discharging too quickly, and one on the outer side about the same height to prevent the water from escaping longitudinally over the sieve and with the pebbles.

If the washdirt requires but little puddling the sieve can be arranged to effect the same by placing two more flanges at equal distances between the two centres, to prevent the stones discharging so quickly and drive the sieve at a greater speed, consequently they would be knocked about more with the quicker revolutions of it in the same time.

C (6), a horizontal sieve, 6 feet long by 2 feet wide, which is suspended into a large water-tight cistern 12 feet x 2 feet 3 inches x 4 feet high. The sieve has a copper, brass, or iron-wire netting bottom. The first 3 feet in length having six holes or meshes to an inch. Should the tin ore to be operated on be of a larger grain than what is now in the Vegetable Creek District, then the wire bottom will have to be larger in proportion; the remaining part of the sieve to be eight holes to an inch. The fine tin ore travels with the water and refuse a greater distance; consequently a finer wire bottom is required in the sieve at the discharging end. If the tin to be treated is of a varied nature (as is the case very often in this locality being a coarse grain and fine together) the sieve can be arranged to be equal to the class of washdirt to be operated on; the sieve can be any size between 6 feet x 2 feet wide, or 2 feet wide one end by 1 foot wide the discharging end. (Vide sketch 1, 2, and 3.)

Thus when two classes of tin ore are associated, the following alteration in the sieve is required:—The sieve at the receiving end being closed to $1\frac{1}{2}$ feet wide, the coarse tin quickly settles through the sieve without any difficulty and is discharged into a compartment beneath, and can be drawn off through valve marked *b*. (Vide sketch elevation plan.) And as the fine tin travels a greater distance with the waste and water, the following alteration must be made:—The movable sides (D 5 in plan) are opened to 2 feet wide, so that the



last 3 feet in length gives a greater surface to operate on the refuse, and the current of water is not so rapid, the fine tin is deposited with a little fine sand into compartment No. 2, and be treated separately. Again, if the tin is all coarse, the following alteration takes place:—The last 3 feet of the sieve is closed to 1 foot wide for the purpose of creating a more rapid current of water, which assists the discharge of the waste after the ore is separated; by this a larger quantity of dirt can be washed daily.

This horizontal sieve differs greatly from any other sieve used for jigging.

The first 2 feet in length have 2 inches of "raggan" or coarse tin ore on top of the wire bottom to act as a filter (*vide* sketch A), the following 2 feet have $1\frac{1}{2}$ inch of "raggan" (B), the last 2 feet have 1 inch (C). The top of the ripples (D) are placed transversely to the sieve to keep the "raggan" or coarse tin from shifting, and have half inch run towards the discharging end.

The sieve has two motions (vertical and horizontal) to facilitate the discharge caused by a fixed arm to the side of the hatch.

(D 5.) Movable sides of the sieve, so as to be able to alter the shape and size of the sieve suitable to the nature of the dirt and tin ore to be operated on.

(d 4.) Receptacle for tailings or waste, the outlet being through valves marked in plan (*vide* sketch showing end elevation of large hatch and fall of tailings into track) which is afterwards drawn up an incline tramway by a horse and tipped to fill up worked-out ground.

(E 1.) Rope, cause of the motive power, worked by one horse, that is if steam-power is not available.

(F 2.) Belt of Californian pump for lifting water.

(G 3.) Californian pump $10 \times 2\frac{1}{2}$; to be a suitable length, according to the vertical height the water has to be raised. A steam-engine and centrifugal pump would perform the whole work far more economically where a large area of tin land is in command.

(H 7.) Cam wheel on a shaft.

This cam wheel lifts a lever on which the whole sieve is suspended. By this regular rise and fall of about $\frac{1}{2}$ an inch a motion is given to the sieve similar to a common jigging machine which keeps the dirt and tin ore in a continual motion. The ore being of a specific gravity of 6.7, and the waste from 2 to 3, the tin settles to the bottom and passes through to coarse tin acting as a filter, thence through the wire bottom into a compartment; the motion keeps the light waste on the surface, which is removed by the current of water, and passes over the sieve into the hatch (d 4).

(I 8.) Belt driven from main shaft, and causes the revolution of the cam wheel (H 7).

(J 9.) Belt and pulley driven from the main shaft, causing the cylindrical sieve to revolve, which separates all pebbles and stones from the fine tin stuff before passing into the machine.

The stones or pebbles fall into a bin arranged for the reception of same, and removed by truck and horse. (*Vide* plan.)

This new tin-slucing apparatus can wash from 60 to 70 tons of puddled dirt at a cost of only about 6d. per ton, including the removal of refuse (tailings and pebbles) and pumping sufficient water for two puddling-machines, viz. :—

	s.	d.
One man in charge of machine	8	0
One youth attending feeding hopper	3	6
Two youths removing refuse	10	7
Two horses removing refuse by trucks	6	0
One horse working machinery	3	0
One boy driving "	2	0
Oil	0	6
	33	7

It was first of all erected and driven by steam, and found to answer so admirably that another one, on the same principle, but to be worked by horse-power, is now in the course of rapid construction on another portion of the mine. This invention, when more generally known will, I do not doubt, be eagerly erected by most of the claimholders, to operate on the large heap of tailings, and at present unpayable ground, which have been worked and left during the earlier period of tin-slucing in this district.

The other mines do not call for much remark, as they are all steadily working in the banks of Vegetable Creek, where in a good many places the patches found are nearly equal in richness to what was formerly worked in the bed of the creek.

The returns and prospects of the Y. Waterholes Creek (situated 3 miles southerly) are far more encouraging. A population of about eighty persons are located here, a post-office established, and a public-house and stores being rapidly erected, with every prospect of it being a flourishing little township, as the surfacing, which has been worked during the past twelve months, and yielded $170\frac{1}{2}$ tons of tin, is now being traced in several places into deeper ground under the basalt. Several shafts have been sunk further up on the hill, which after going through the basalt and layers of drift and pipeclay, have struck at depths varying from 20 to 60 feet a run of wash with excellent prospects.

Within the last six months, when the shallow deposits of tin were beginning to be worked out the miners have directed their attention to deep sinking, and by far the most interesting mining operations that are being carried on in this division are to be noticed at Vegetable Creek and its vicinity, where the basaltic range that runs north-westerly for a distance of about 25 miles, and forming the main watershed, at this part, between the

Dumaresq and Severn Rivers, is now being tested with a view to open up the valuable resources that it is confidently believed to contain, and respecting the origin of which various theories have been propounded among the mining community of this district; one is, that the flow of basalt or lava appears to have originated at some remote period at Ben Lomond, the highest point of a range of mountains about 20 miles south of Glen Innes. A second theory is that the seat of eruption was at or in the vicinity of the present valuable mine the property of the Vegetable Creek Tin Mining Company, and the course assigned to the ancient river was from south-east to north-west.

Mr. Mining-surveyor Christie, however, runs counter to these opinions, by affirming that the flow of basalt was from north-west to south-east, or from Rocky Creek towards Vegetable Creek, and endeavours to substantiate his own theory, and to determine the original course of the lava, by both plans and reports.

The features of the locality have gone through some wonderful changes since that period, as what was then the bed of the river is now from 200 to 1,000 feet above the level of the present stream. The depth of the basalt is about from 10 to 90 feet, and the width from $\frac{1}{4}$ to $\frac{1}{2}$ of a mile.

The object of the operations that are now being carried on is to reach the deposits that are supposed to lie beneath this stream of lava, and for that purpose the range in which it is imbedded, is being prospected by shafts. A great number of tracts have been taken up along this basaltic formation, in some of which a considerable amount of labour and capital have been expended.

From shafts that have been sunk along this range, both here (Vegetable Creek) and 15 and 25 miles north-west, Kangaroo Flat and Rocky Creek have given the different parties of spirited prospectors every indication of the existence of every reliable and extensive deposits of tin in what was formerly the old bed of the river. It will thus be seen that the operations that are in progress as described are of a most interesting character, and are likely to be attended by very important results, for should success crown the efforts to develop the stanniferous deposits in the present instance, attention will then be drawn to the other basaltic belts known in this district, under which doubtless equally valuable deposits are hidden.

The very rich deposit of wash in the Vegetable Creek Tin Mining Company's Mine, and from which the enormous yield of 1,795 tons 9 cwt. has been obtained up to the end of last year, (1876), is now gradually getting more narrow, but vigorous efforts are being made to trace the onward course of the lead.

During 1876 this company have expended a large sum of money, in pushing on prospecting operations ahead of their main run, but they have not as yet been rewarded by striking any remarkably rich deposit. About $\frac{1}{4}$ a mile ahead southerly a very narrow but pretty fair run of wash was found at a depth of from 80 to 96 feet, in a gutter having an average width of 10 feet, which has yielded at present only about 20 tons of tin, after following and working out over 300 yards. The reason this gutter was not more productive is undoubtedly owing to the hard rock over which the deposit or leads is found; the bed rock is changed from a soft claystone bottom, to a hard granitic rock.

Still the proprietors are eagerly tracing this run, and from the numerous little patches of very rich wash met with in it they are confident of getting it very good when the gutter widens.

About $\frac{1}{4}$ of a mile westerly from the above operations Messrs. Wesley and party are prospecting their block of 180 acres mineral lands, and in one or two of the shafts bottomed at 90 feet a vein of drift carrying black tin has been struck which has given them every confidence of ultimately striking payable wash.

The Vegetable Creek Tin Mining Company have also been extensively prospecting their land at the Graveyard Creek, situated $\frac{1}{4}$ mile south of Vegetable Creek, but they have been little more fortunate, as at depths varying from 90 to 96 feet a pretty fair run of wash, composed of soft granite boulders and drift, with some waterworn black tin, was found; this prospect being so encouraging, the company have at present fourteen men prospecting the run thoroughly, and raising large paddocks of wash, which they intend sluicing immediately the rain sets in.

Messrs. Proctor and party have taken up 40 acres of mineral land about $\frac{1}{4}$ of a mile further easterly on this basaltic range. They have already sunk several shafts, in the last of which, at a depth of 47 feet, a run of wash 18 inches thick was struck, with very good prospects, so good that they have again started another shaft, at which they are actively engaged, and doubtless these enterprising prospectors will ultimately strike a payable mine, of which they have every indication. The prospects in this mineral lease are held in so much favour among the miners that an eighth share has already changed hands for £20.

At the head of the Y-Water-hole Creek, about 1 mile easterly from Proctor and party, the surfacing, which has been worked so remuneratively the last year, is now being traced under the basalt in Messrs. Cadell, Mitchell, & Co.'s land (500 acres, M.C.P.)

Several shafts, averaging a depth of 60 feet, have been sunk, in all of which wash with good tin was struck, and during the ensuing year the proprietors intend to start active prospecting operations there, as the prospects are so encouraging, and warrant a belief that it will eventually prove a success.

Eight miles north-west of Vegetable Creek 360 acres of mineral land have been applied for on this basaltic range during the year. Some fair prospects were obtained here, and the parties are steadily and perseveringly sinking shafts, and appear to be sanguine of the future results of their labour.

At Messrs. Hall Bros. & Co.'s mineral selection at Kangaroo Flat prospecting is being energetically carried on. A run of wash, 2 feet thick, is being traced into the basaltic hill, at about 90 feet below the surface, showing some excellent prospects of tin. Similar prospects were to be seen at Mount Look-out, Rocky Creek, 25 miles north-west of Vegetable Creek.

Near Deepwater, about 20 miles south-easterly from here, Messrs. Percy and party have applied for a mineral lease of 60 acres on another belt of basaltic formation; this claim is represented to be very good, which the appearance of the specimens fully substantiates.

The future of this district depends upon the development by these parties of miners and private companies of our resources at deep levels; as an important find the deep leads would show a stability and permanence in our deposits which would create for the district a name, and place our mines on a basis so solid and practical that investors, who now hold aloof, would come forward with a confidence which nothing but successful deep sinking can establish.

Mining progress at the Gulf and Glen Creeks is not very flourishing; at the former place a patch of pretty good shallow ground has lately attracted a number of diggers to that mountainous locality; they appear to be satisfied with their prospects, and their number is daily increasing.

At the Mole tableland as yet the ground may be said to have been barely tested, although tons of stream tin have already rewarded the workers; but the main discoveries have yet to be made. There are indications of lodes all over this section of the Vegetable Creek Tin Fields, and in many places the outcrops are most distinct, but as yet remain untouched; and the general opinion is, amongst those who have had the most thorough experience, that ultimately the discoveries will be extended, and it will prove a rich tin-bearing locality.

The number of acres of mineral lands applied for through this office was 1,360, as compared with 660 acres in 1875, and the amount of revenue derived from the sale of mineral licenses and rents lodged with applications for mineral lands, was £490 in 1876, and £260 in 1875, which shows a very satisfactory increase, and I have no doubt during the ensuing year a much larger area of mineral land will be applied for and worked, now that the department is issuing the leases so quickly, and cancelling them at once if the applicants fail to take delivery of them.

The aggregate number of tons of tin ore raised from the commencement of tin mining in 1872 from the whole of the mines in this division, to the 31st December, 1876, was ten thousand eight hundred and ninety-two (10,892) tons 5 cwt.,—in obtaining which accurate information I am greatly indebted to the Grafton agents of the Steamship Companies, the lessees, managers, and tin buyers generally in this district, who have all most kindly assisted me in that rather arduous task to arrive at the desired end. In future the yield from these mines will be more easily obtained, as I am in communication with all parties interested in them, who have all volunteered to afford me every information on that head.

The total value of the mining plant in this district cannot be accurately obtained, but that on the fifteen principal mines situated at Vegetable Creek is £7,600, which includes horses, tin, stores, &c., on each holding.

The township of Vegetable Creek is very much improved as regards its buildings, having now the appearance of permanence, which it lacked in its earlier days, and which can be given to any place only by a fixed population. Now that a branch of the Bank of New South Wales and a Telegraph Office have been established, Vegetable Creek is bound to become a place of considerable importance, as it is the centre of a large mineral district.

There is no doubt but this locality will furnish profitable employment for a large number of miners for a long time to come if good luck attend the labour of the several prospecting parties now out in the vicinity; and, taken as a whole, the prospects of this tin field are healthy and progressing, and with the influx of more capital to test the leads as they become deeper, and more difficult to work, I believe the result would be beyond the most sanguine expectations.

The total yield of Tin Ore from the Vegetable Creek Division, Clarence and New England Mining District, from commencement of mining operations, in the year 1872, to the 31st December, 1876.

Name of Company or Mine.	Locality.	Yield of Tin Ore during				Total yield from each mine or locality from 1872 to 1876.	Total.
		1872 & 1873.	1874.	1875.	1876.		
DEEP LEADS.							
The Vegetable Creek Tin Mining Company (Limited.)	Vegetable Creek.	Tn. cwt. qrs. 108 19 0	Tn. cwt. qrs. 224 0 0	Tn. cwt. qrs. 741 12 0	Tn. cwt. qrs. 715 18 0	Tn. cwt. qrs. 1,796 9 0	
Campbell & Gibson's Mine (Cubis' Tribute) ..	"	.....	.....	.....	217 0 0	217 0 0
Rose Valley (formerly Reynolds & Co., now Irby, Andrews, & Party.)	"	127 0 0	40 0 0	.....	55 12 0	222 12 0
Kangaroo Flat, Strathbogie (Hall Bros. & Co.)	"	10 0 0	50 0 0	.....	3 10 0	63 10 0
The Springs, " " "	"	6 0 0	10 0 0	.....	.....	16 0 0
Surface Hill (Lewis & Others) .....	"	.....	.....	40 0 0	.....	40 0 0
Rocky Creek, Mount Look-out (Hall & Party)	"	.....	.....	15 0 0	17 0 0	32 0 0
Total yield of Tin from Deep Leads, 1872 to 1876	2,336 11 0
SHALLOW WORKINGS (CREEK CLAIMS).							
The "No Mistake" Mine (Campbell & Gibson), (Cubis' Tribute)	"	30 0 0	30 0 0	30 0 0	4 0 0	194 0 0	
The Great Britain Tin Mining Company (Limited).	"	28 0 0	130 0 0	481 0 0	547 9 0	1,186 9 0	
Tomlinson's (now the property of the Great Britain Tin Mining Co.)	"	35 0 0	70 0 0	.....	.....	155 0 0
Little Britain (Irby, Andrews, & O'Donnell, late L. R. Ashton)	"	20 0 0	100 0 0	106 0 0	126 2 0	351 2 0	
Little Wonder (Irby, Andrews, & O'Donnell, late Masund, Hood, & Others)	"	95 0 0	65 0 0	139 0 0	123 2 0	422 2 0	
Moore & Speares (including yield of "Little Minnie" in 1872)	"	334 0 0	410 0 0	450 0 0	300 0 0	1,494 0 0	
Baalgammon (Marks, Lee, & Others) | .....	"	240 0 0	120 0 0	180 0 0	117 2 0	657 2 0	
Nonpareil (Marshall & Others)	"	316 0 0	150 0 0	122 0 0	51 2 0	639 2 0	
Vegetable Creek Mine (Hall Bros. & Co.) ..	"	230 0 0	120 0 0	80 0 0	78 0 0	508 0 0	
Rothschilds (Anderson, Hansen, & Others)	"	150 0 0	110 0 0	115 0 0	85 0 0	460 0 0	
Six-mile (Hall Bros. & Co.)	"	90 0 0	30 0 0	60 0 0	36 0 0	206 0 0	
Gordon's (Hamilton Gordon)	"	38 0 0	40 0 0	80 0 0	5 15 0	163 15 0	
Tent Hill (including Hall Bros. & Co., Moore & Speares, and other Companies).	"	195 0 0	60 0 0	50 0 0	46 0 0	351 0 0	
Tent Hill Creek (including M ^r Masters & Co., 147).	"	107 0 0	40 0 0	10 0 0	37 0 0	194 0 0	
Glen Creek (including the Banca, Glen Lode, and other Companies).	"	46 0 0	70 0 0	40 0 0	38 0 0	208 0 0	
Gulf Creek (including Hetherington's, Gulf Stream, and other Companies).	"	72 0 0	50 0 0	75 0 0	62 0 0	259 0 0	
Mole Tableland (approximately)	"	200 0 0	30 0 0	100 0 0	73 0 0	453 0 0	
Y. Water-holes Creek (including Brown's and other M. L's, and Graveyard Creek, and Big Ben).	"	34 0 0	50 0 0	80 0 0	77 12 0	241 12 0	
Y. Water-holes Creek (Moore & Speares), (Fraser's & Cubis's Tribute).	"	15 0 0	.....	.....	155 10 0	170 10 0
Grampian's (Hall Bros. & Co.)	"	20 0 0	100 0 0	40 0 0	27 0 0	187 0 0	
Total yield of Tin from shallow workings, 1872 to 1876	3,505 14 0
Total	2,591 19 0	2,249 0 0	3,042 12 0	3,008 14 0	10,892 5 0	10,892 5 0

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NEW ENGLAND AND CLARENCE DISTRICT—DALMORTON DIVISION.

(Wm. F. Poole, Mining Registrar.)

No progress has been made in mining during the past year. The Tower Hill Company's claim, Perseverance Reef, is the only one at present working. They have recently applied for a lease of 25 acres, including the whole (of what is believed to be the most valuable portion) of the Perseverance Reef, from the prospectors to No. 9 North. When this lease is granted it is confidently expected that mining will be carried on with more vigour than it has hitherto. At Cunglebung the reefs are entirely deserted, and the crushing machine dismantled.

NEW ENGLAND AND CLARENCE DISTRICT—LUNATIC DIVISION.

(M. J. Synge, Mining Registrar.)

I HAVE the honor to forward herewith as many forms filled up by the different owners of the claims as I could obtain. There is considerable difficulty in obtaining full information respecting the quantity of gold won in this division, in consequence of the miners being scattered over a very large extent of country, and quite a number of claim-holders do not care to give information and send their gold direct to the Mint; consequently no correct information can be obtained respecting the returns from them.

In the immediate neighbourhood a number of abandoned quartz leases have been taken up, and are now worked profitably, the miners appearing satisfied, and I have heard of some rich hand crushings. The quantity of stone on the field at present is about 100 tons; payable returns is expected from it; the amount of gold won from the alluvium you will find in the form filled up by Mr. J. Farley, of Pretty Gully. I believe a much larger quantity of gold will be won this year, as a number of water rights are now taken up to work a claim known to be rich, but owing to the want of capital this mine has done little more than pay expenses. It is now to be worked on an extensive scale, and there cannot be a doubt of its success. The mine is situated at a place called Poverty Point, Timbarra, and the formation decomposed silica. They have a face on the work now some 50 yards wide and 30 deep, and a shaft sunk 40 feet through the same formation, together with a good prospect of gold. The mine will give employment to a great number of miners when the works are completed so as to ensure a plentiful supply of water. The quartz reefs now worked at Tooloom I cannot get full information from, but as the work is carried on vigorously we may assume the mine is payable. I am informed there are about twenty-five Europeans on the Tooloom gold-field who are nearly all working the old alluvial; there are no Chinese. I have had no account from the Timbarra gold-field, but I hear it is nearly deserted; there are a few Chinese working about in the creek. A new reef was discovered some short time ago at a place called Slaty Creek, 14 miles distant from this place, on the Grafton Road, 4 miles from Darcy's Hotel, Sandy Hills. From the number of applications I believe there will be a large number of miners finding profitable employment thereon. The prospectors have raised about 40 tons, and have hand-crushed 18 ounces from a small parcel of specimens. I have seen some specimens from the claim which were nearly all gold—very rich. The men that have made this new discovery have been prospecting about that locality for six months. The formation is slate, the reef lying flat; one lease of 12 acres has been applied for and four other claims also. The gold has been tested in Sydney, and is worth £3 17s. per ounce at the Mint. Machinery will shortly be placed on the ground when the reef will be thoroughly tested. The Yabra-race at Tooloom has been deserted through disputes among the party. The Kangaroo race has been cut another two miles to Frazer's Gully, making in all 16 miles. When this race is finished it will give employment to a great number of miners. Pretty Gully is a very old diggings, nearly worked out. There has been no new ground opened, the work is sluicing the old alluvial in the bed of the creeks and fossicking. It is difficult to ascertain the number of miners in this division; they are too scattered about; but from what I can gather there are about 150 Europeans and 12 Chinese; a good many of these do not take out miners' rights. The quartz reefs at Pretty Gully have been deserted for nearly two years; no work done on any of them. There is a machine at Pretty Gully idle; it is worth £500; Water Power Mill—Farley & Armstrong are the owners. At Lunatic there have been no crushings done for six months, owing to the want of water and carters, but most of the claim-holders have hand-crushed their specimens, which have given them rich returns.

NEW ENGLAND AND CLARENCE DISTRICT—SOLFERINO DIVISION.

(James Fisher, Mining Registrar.)

THE dullness which has so long prevailed on this gold field shows no sign of mitigation; there are at present but two quartz claims working, viz., the Redfern Company's Mine on the Garibaldi Reef, in which six men are employed to drive a tunnel into the main shaft, which they expect to reach in the contract at present in operation (40 ft.); the shaft is 200 ft. in depth and the manager expects the drive to cut it at the bottom. And the Shellmacker (No. 6) Gold Mining Company, which has employed four men all the year sinking until recently, now driving at the 140 ft. level (the lowest reached). The Lion Company's Mine is still idle, and I cannot hear of any definite arrangements being made for a resumption of work.

In the alluvial workings at the Ewinger, Bulldog, and Old Scrub there are a few men working, mostly singly or in pairs; they appear to make a living but nothing more.

On the Solferino or Graastree Creek one man has been working on a flat immediately above the township but with very poor results. He reports 13 ozs. of gold for 1876. A selection for antimony has been applied for by Mr. H. Maurice, who has now three men at work upon it. This appears a really promising discovery, as two men in one week raised 6 tons of dressed ore although a good deal troubled with water, having but the rudest appliances to bale with. Several other lodes of the same mineral are known to exist in the neighbourhood, and one very considerable copper lode.

NEW ENGLAND AND CLARENCE MINING DISTRICT—BALLINA DIVISION.

(*Henry Bassmann, Mining Registrar.*)

THE locality of the mining is still confined along the sea-beach, about 20 miles north and south of the Richmond River Heads. There has been a slight improvement on the previous year. For the last six or seven months there have been from twenty-five to forty men almost constantly at work earning at an average about £3 per week each. For the gold sold here they have obtained from £3 5s. to £3 7s. per oz. The most however is sent to Sydney privately, where, when assayed, it realized from £3 15s. to £4 per oz.

NEW ENGLAND AND CLARENCE DISTRICT—GLEN INNES DIVISION.

(*W. C. Rodgerston, Mining Registrar.*)

SINCE the date of my last report upon the mining industry in my division but small progress has been made in the development of the rich mineral resources of this district. This is partly attributable to the long continued droughts with which we have been visited as well as to the present depressed state of the tin market; although some of the mines are being profitably worked by far the larger portion of the rich stanniferous deposits of this division from the causes above mentioned remain untouched.

One great obstacle to the successful development of the mines is that the basaltic formations have covered nearly the whole of the Devonian drifts; hence since the panic of 1873, capitalists have been extremely cautious in prospecting under these basaltic flows, owing to the difficulty of sinking.

The localities referred to in my last report as being the principal at which tin-mining has been carried on to any extent, viz., Hogue's Creek, Severn, and Skeleton Creek, have been virtually abandoned until a recent date. A few parties are now taking up small mining areas, which are being successfully worked.

A little gold still continues to be obtained at Glen Elgin and Oban, but at Butterleaf, near Glen Elgin, the workings have been entirely abandoned.

About Oakwood and the gulf several shafts have been sunk and promising indications of gold obtained, but until capital is brought to bear the successful development of the gold-mining industry in my division cannot be hoped for.

REPORT OF THE INSPECTOR OF MINES UPON THE MINES AT ADELONG.

(*W. H. J. Snee, Inspector of Mines.*)

I HAVE the honor to inform you that I have inspected several of the principal quartz mines at Adelong.

The whole of the Adelong Gold Field comprises a succession of hills and mountain ranges, there being very little level country throughout the district; the hills are of granite formation, the reefs or veins numerous and rich, and their course generally north and south with few exceptions.

The reefs or veins are found in channels varying from 2 to 10 feet in width, with walls of granite formation. The veins or crushing stuff in these channels vary from 6 inches to several feet, and consist of quartz largely impregnated with pyrites, and encased in a mixture of black slate and quartz; the quartz is often crushed separately, and called first the slate mixture, second-class crushing stuff.

Sometimes several gold-bearing veins are met with in one channel, and it is for this reason as well as for the proper security of working a mine that the whole width of the channel has to be taken out, no matter how narrow the actual crushing stuff may be; therefore these wide channels often cause great expense, and retard the progress in opening and stopping the levels in the Adelong Mines.

The principal channels at present opened up, and in which the richest veins are imbedded, are situated on the western and eastern sides or slopes of the Victoria Hill. That on the western side is called the Victoria line, and that on the eastern side the old line of reefs; and there is a reef between these two, called the Middle Reef.

Upon the Victoria line of reefs there are at present the following mines:—

The Great Victoria Gold Mining Company (Limited) has made a name for itself, by having laid claim to the Government reward of £1,000, and which was on the 20th January fully reported on by me. This mine, which consists of two 5-acre leases, is now down about 818 feet; a trial crushing of 6 tons from the 810 feet level yielded 15 ozs. 2 dwts. 12 grains, in addition to which about 60 lbs. of specimens were sent by me to the Department of Mines, Sydney. 3 tons of quartz will now be raised under my personal supervision, to be crushed at the Mint as a further test.

In June, 1873, this mine was only 370 feet deep; in July, 1875, the total depth was 565 feet; but since September, 1875, when the Government reward was first offered up to date, the shaft has been sunk 253 feet, making a total of 818 feet. The quartz at the lowest depth looks certainly payable, and should yield at least 2 ozs. per ton, of which 1 oz. per ton will pay all expenses for raising, carting, crushing, &c., and leave a clear profit of 1 oz. per ton.

South of the Great Victoria is the Research Mine, an 8-acre lease, worked by a private company; depth about 470 feet. The company work at present on a vein about 14 inches wide, which within the last fortnight has turned out some very rich crushing stuff. This mine, with capital properly invested, and work systematically carried on, should not fail to be a good dividend paying one.

The Union Company's Mine, a 6-acre lease, greatest depth 420 feet, has a little water in its workings. It formerly yielded as much as 14 ozs. per ton for several crushings in succession, although idle now for some time; if capital, ability, and economy were brought to bear on this mine and machinery, erected for winding and for raising water it would not fail to pay a large interest upon the capital judiciously invested.

The Little Victoria Company's Mine, a 20-acre lease, is now lying idle, although hundreds of tons have yielded 10 ozs. per ton. The deepest part of this mine is not more than 200 feet deep, and it seems strange that such a large piece of ground should lie idle. I would therefore respectfully draw the attention of *bond fide* capitalists to this mine, as it must prove a profitable investment.

North of the Great Victoria are the following mines:—

Annett's (a private company), a 3-acre lease; greatest depth 635 feet. This company worked for about eight years without any returns for capital and labour expended, but within the last twelve months they have crushed as high as 6 ozs. per ton; they are now crushing, and expect fully 1,000 ozs. out of about 300 tons; the quartz they are now raising is expected to yield better than their present crushing.

This mine is now one of the best paying gold mines in New South Wales, and has every appearance of permanency, although its payable capabilities only commenced at the depth of over 500 feet below the surface.

The Flagstaff, or Amos Brothers Mine, an 8-acre lease, greatest depth 815 feet, at present not payable. I am of opinion the company should have cross-cut, because although they may be in the Victoria Channel, the same as Annett's in the south, and the Williams Gold Mining Company's on the north of their boundary, still as there are several channels running parallel through the Victoria Hill, there is a great probability that a shot or run of gold may miss one channel and be found parallel in another, to use a miner's phrase, jumping from one channel or vein into another, leaving in a zig-zag fashion barren and gold-bearing parts alternately.

Throughout the Australian Gold Fields this zig-zag fashion in the runs of gold is very often observable, whether in quartz or alluvial, and it is through this that rich deposits are often found opposite the barren places of a rich but patchy lead of gold; therefore cross-cutting should be more adhered to; and until the contrary is proved, Adelong should not be considered an exception to the above rule.

The Williams Gold Mining Company (Limited) own a 6-acre lease, greatest depth, 635 feet. The mine has given several dividends, but is at present worked on tribute, the Company finding all tools, material, carting and crushing for half the gross yield of gold obtained by the tributors; the company have a 15-head battery worked by water-power; also two of Denny's pulverisers in connection with their mine. The pulverisers (although not so successful on other gold fields) the manager of the Williams Gold Mining Company highly recommends as a successful gold-saving machine; the shaft in this mine is substantially skitted; and all raising and lowering is done by cages, instead of the slow method of using buckets; this alone must be a great saving to the Company.

The North Williams Gold Mining Company (Limited) has an 11-acre lease; greatest depth 590 feet. The company is at present cross-cutting at the 425 feet level, a very sensible plan; although the country is hard and the progress tedious and expensive, there is a great probability of success.

Everything in connection with this mine is substantial, the air good, tools and ladder-way faultless, the shaft securely skitted and worked by cages, which is a great saving to the company; the vein or lode has a steadier underlay to the east, and is more of a solid, uniform, and less buncy nature than the veins in the mines on the southern slope of the Victoria Hill. The country is very hard at present, but as the mine has been rich and well managed, I have no doubt when sinking and cross-cutting is carried on, payable veins will again be met with and dividends paid as formerly.

There are two or three other leases further north on this line, but as nobody has been at work on them for a great length of time I could get very little information concerning them.

Although most of the mines on the Victoria line of reef are over 500 feet deep they are still worked by whims and horses, which at the best is but slow work. The principal reason in favour of horses is that these mines have not enough water to supply an engine, and the cost of making tanks or drawing water for the use of the engine would exceed the cost of horseflesh; however if these mines keep on sinking, machinery for winding purposes will have to be erected.

About 300 yards east and running parallel to the Victoria Reef is the old reef which has been very rich.

The crown of the Old Reef Mine, as its name indicates, is on the crown of the hill. Several thousands of ozs. have formerly been obtained out of this mine (as annexed statistics will show), but the mine is at present idle; it contains a little water in its workings, which though long standing overflows, and thereby injuriously affects and impedes the progress of sinking in Prowse and Woodward's mine; greatest depth about 400 feet. South of the crown of the Old Reef is Prowse and Woodward's mine (at present held in connection with the Adelong Company), a 5-acre lease; greatest depth, 610 feet, and still sinking. For about 90 feet there has been only the channel but no sign of vein visible. During the last fortnight however great improvements have taken place. At first a small mundic vein, about 1 inch wide, was struck; this has in the last few feet enlarged to 4 inches wide, thickly impregnated with pyrites and showing gold. This is the deepest shaft on the whole line of the Old Reef; therefore this discovery is of the greatest importance, and there is now every indication that under the present able mining management this mine will again be one of the best in the Colony.

At the 470-foot level there is a drive from the main shaft about 220 feet, part of which is let by contract, and within the last week gold was struck in this south drive; at present the vein is about 6 inches wide, and shows gold at the rate of 1½ oz. per ton.

Our Own Company's Mine, a 5-acre lease (greatest depth about 400 feet) is now lying idle (while the Adelong United Company are prospecting north and south of this mine); there were several thousand ozs. of gold extracted from this mine, and surely it cannot be said that to sink a shaft to a depth of 400 feet has proved the intrinsic value of a mine.

The Adelong Gold Mining Company, now united under the same proprietary and management as Prowse and Woodward's, and called the Adelong United Gold Mining Company, owns a 10-acre lease; greatest depth about 480 feet. There is a winding engine of about 12-horse power in connection with this mine; the only winding engine at present at work on the Adelong Gold Field. Although this mine and the Prowse and Woodward's are held by a few gentlemen in Sydney they fully intend to prospect and develop these mines. The mine is under able management, and there is every probability that the owners will be rewarded for their pluck and perseverance.

These are all the mines at present at work on the line of the Old Reef; there are however some leases north and south of this line lying idle, the proprietors acting the dog in the manger: they will neither work nor yet give up possession of their leases, a system I am sorry to say adopted throughout our gold fields, which is injurious to the *bond fide* miner, a fraud on the revenue of the country, and detrimental to the true interest and advancement of our gold fields. A strong remedy should be adopted and the labour conditions stringently enforced.

Middle Reef: This reef lays between and runs parallel to the Victoria and the Old Reef. As much as 4 ozs. per ton has been crushed near the surface, but the mine now lies idle; the deepest shaft is about 200 feet.

The Victoria Reef underlays to the east, the Old Reef to the west, and the Middle Reef slightly underlay to the west, but is almost perpendicular, and as the greatest distance from the Victoria to the Old Reef is only 300 yards, there is a probability that these three reefs will join at a great depth, and so form one and the main reef of this district.

About 1 mile north of the Victoria Hill there are several lines of reefs.

The Caledonian, North Caledonian, North and South Curragong, Eureka, Victoria Extended, and Donkey Hill.

Most of these mines are now prospecting, but I am glad to state that the Victoria Extended has lately come upon quartz at the depth of about 180 feet from the surface, which would realize about 3 ozs. per ton.

About $\frac{1}{2}$ mile east of the Victoria Hill is the Camp Reef, greatest depth 180 feet, now idle, although crushings of 3 ozs. per ton have been taken out of it.

There are also the Gap Reefs about 1 mile south by east from the Victoria Hill; greatest depth 150 feet. Very little work has been done on these reefs for the last fifteen years, although Boyd and party and others crushed as high as 4 ozs. per ton for several crushings. Some of the Adelong residents have enclosed these reefs by fences, which should not be allowed, because although the ground is not purchased, the fencing in of the same will prevent many miners from testing the reefs, especially as there is always a great trouble and expense to the miner if he wishes to enter for the purpose of prospecting these so-called improved auriferous lands.

In the alluvial there are also some mines worthy of notice such as Shepard's sluicing Mine at Shepard's town, about 2 miles from Adelong, but so far I have had no time to visit the same I cannot give any authentic information; I will, however, do so at the first opportunity. I hear Mr. Shepard employs at least seventy men about his mine.

Annexed will be found statistics extending as far back as 1859, clearly showing the great amount of gold taken out of the Adelong Mines from the surface down to about 200 feet.

The claims in 1859 were very small, but they are now converted into leases of large dimensions.

The Adelong Reefs although very rich were almost deserted for several years, and considered worked out by the miners of that day. There were also some writers predicting and setting forth theories through the principal journals of this Colony that the Adelong Reefs, being embedded in a granite country, would not prove payable at a greater depth than 200 feet below the surface. However, this theory predominated only for a time, and practice has proved that these reefs are now payable over 800 feet, with a prospect of an almost unlimited depth. Taking a common sense or practical view of the history of this gold field, one feels astonished that such wealth should lay within our reach, while men clamour for work or capital lays dormant awaiting good investment.

This argument might be met by saying there are now companies on Adelong not paying, and therefore my opinion cannot be correct, to which I can only give the following answer:—As long as companies will persist in the suicidal practice of starting the working of a mine with a nominal instead of actual capital, as long as they persist in declaring dividends without leaving any capital in hand for times of need, so long will there be almost a certainty of failure.

When a mine is paying, sinking and cross-cutting should be forced ahead, but instead of which the bunch, run, or patch of gold is generally worked out, dividends declared, and no capital left to meet the expenses of future development, such as sinking, &c., &c., &c.; consequently as soon as the gold-producing powers of a mine diminish, development is stopped, or, perhaps, a call of one shilling per script made, after which the mine is often condemned as worthless, no matter how shallow or undeveloped it may be; and last but not least this system discourages the mining manager, and gives him no justice, and affords him no opportunity of bringing his ability and practical knowledge to bear on the development of the mine under his charge.

There is one feature in the Adelong Reefs which deserves special notice, that is, that the fissure, cleavage, or channel runs regularly with well defined walls to whatever depth they have as yet been sunk, whether they contain payable veins or not; and this is one reason amongst many others why I firmly believe the Adelong Reefs will prove payable at a very great if not an unlimited depth.

Adelong has at present two crushing machines of fifteen stampers each, worked by water power. One belongs to the Williams Gold Mining Company, the other to Messrs. Wilson and Ritchie (Wilson and Co.); both machines have improvements for gold-saving purposes, but that of Wilson and Co. is certainly one of the best if not the very best on the gold fields of New South Wales.

The returns of gold received at the Mint by escort for the year 1876 places Adelong with its small population third on the list, as the following will show:—

	ozs.	£	s.	d.
Hill End.....	17,299-03	value	68,042	17 0
Parkes.....	17,342-98	"	66,120	2 3
Adelong	16,482-54	"	62,580	11 9
Gulgong	16,236-78	"	62,985	3 6

In conclusion I beg to state that the Adelong Gold Field deserves better attention by *bond fide* capitalists. With capital judiciously invested and prospecting carried on in a systematic manner Adelong would take the first rank amongst the gold fields of New South Wales. No doubt money has been squandered here during the mining mania; nevertheless, it cannot be said that these gold mines are worked out or even developed, but a time will assuredly come when the Adelong Mines will pour out their wealth and cause a reaction in the public mind in favour of gold mining.

My practical experience of gold mining during twenty-two years on the principal gold fields of the Australian Colonies has led me to form these opinions, and I have no other object in view in writing this report than to place our gold mines on a sound and legitimate footing, to provide an antidote for the after effects of the late injurious mining mania, not to induce the capitalists to waste their money, but simply to place before them the intrinsic value of such mines as are worthy their attention.

The following Statistics show the quantity of gold won from the two principal reefs on Adelong, extending as far back as 1859, although some crushings undoubtedly have taken place, of which no record has been kept, and of which no return can now be obtained by me. Still even these returns will show the richness of the Adelong mines, and the insignificant development most of these mines have undergone since 1859.

Date.	Name of Party.	Number of Tons.	Yield of Gold.	Remarks.
From 1859 until 1863	Baker & Co.	500	osm. dwts. 4,000 0	The whole of these claims are now immersed into a 5-acre lease called the Crown of the Old Hill Company; present depth, 400 feet and idle. Thickness of reef, from 1 foot to 3 feet. Rate per ton, 7 osm. 9½ dwts.
	Thos. Shannon	800	6,400 14	
	W. Williams	700	5,600 18	
	Bullock & Co.	300	2,400 11	
	Fallon & Bunn	300	2,400 4	
	Viegne and Harris ..	700	5,600 7	
	Greville & Co.	400	4,000 14	
	Jenkins & Bull	650	3,900 9	
	Edwards, Bros.	800	1,350 16	
Bagg & Co.	100	400 18		
	Williams	200	1,000 12	
From 1864 until 1876..	Several parties, including the present Company.	4,950	37,056 3	
		3,667½	4,900 15	
Old Reef, Adelong.				
From 1859 until 1863	Jenkins & Bull	500	2,000 0	These claims are now immersed into an 8-acre lease, known as the Old Reef Company, now idle; 300 feet deep. Thickness of reef, from 1 to 3 feet. At the rate of 4 osm. 8½ dwts per ton.
	Carreiras	300	1,500 0	
	Rutter & Co.	90	450 0	
	M'Gulvery	40	200 0	
From 1864 until 1875..	Several parties, including the present Company.	980	4,150 0	
		1,475	3,308 10	
From 1869 until 1868	Lind & Co.	400	3,200 0	These claims have now immersed into a 5-acre lease known as Prowse and Woodward's, still working. (See report on Adelong Reefs). Thickness of reef, from ½ foot to 3 feet. 7 osm. 16½ dwts. per ton.
	Mitchell & Co.	400	3,200 0	
	M'Larragan & Co.	300	2,100 0	
	Skinner & Co.	20	100 0	
	M'Leaman & Co.	18	72 0	
	W. Williams	20	80 0	
		1,158	8,812 0	

Date.	Name of Party.	Number of Tons.	Yield of Gold.	Remarks.
<i>Old Reef, Adelong—continued.</i>				
From 1863 until 1876..	Several parties, including the present Company.	1,480½	3,147 0	
	Hargraves & Co.....	25	87 0	Now 5-acre lease, known as Our Own Company; idle; 400 feet From 1 to 3 feet. 4 ozs. per ton.
	Carter & Co.....	20	70 0	
	Wilkenson & Co.....	12	60 0	
	Pearce & Co.....	16	80 0	
	Iredale & Co.....	60	360 0	
	Hillhouse & Co.....	500	2,750 0	These mines are now in a 10-acre lease, known as the Adelong, which, united with Frowse and Woodward, is called the Adelong United; still working; From 1 foot to 3 feet At the rate of 5 ozs. per ton.
	Griffith & Co.....	450	2,475 0	
	Leaman & Co.....	350	1,750 0	
From 1859 until about 1865, idle for many years, depth 460 feet	Dent & Co.....	200	1,000 0	
	Lewington & Co.....	80	400 0	
	Cumberland & Co.....	100	500 0	
	Lismore & Co.....	80	300 0	
	Hay & Co.....	50	250 0	
	Kennedy & Co.....	48	144 0	
	M'Cord & Co.....	20	80 0	
		2,018	10,009 0	
<i>Victoria Reef.</i>				
From 1859 until 1875..	South of Research Gold Mining Compy.	4,335	9,599 13½	Two leases, one 6 acre, one 20 acres; both idle. 2 ozs. 4½ dwts per ton. Thickness of reef, 1 to 3 feet.
	Dawson	8	25 0	These mines are now included in a 5-acre lease, the property of the Great Victoria Gold Mining Company. 2 ozs. 1½ dwts per ton. Thickness of reef, from 6 inches to 2 feet.
	Trudgoun	120½	444 10½	
From 1867 until 1872	"	148	251 9	
	"	166½	633 0	
	"	124	294 10	
	"	63	85 0	
	"	98	174 13	
From 1873 until 1876, both inclusive	Great Victoria Gold Mining Company.	816	923 3½	Great Victoria Gold Mining Company, first crushing in 1873.
	"	981½	2,923 10½	
	"	1,538½	2,536 9½	
		4,085½	8,301 15	
From 1866 to 1867, not payable for 3 years.	Annett's	180½	1,004 11	Annett's Gold Mining Company (a private Company). 4 ozs 7½ dwts. per ton. Thickness of reef, from 1 to 3 feet.
	"	22	27 13	
	"	108	592 0	
1876	"	138	362 0	
	"	452½	1,986 4	
		489	1,184 19½	Flagstaff Gold Mining Company, a private Company; an 8-acre lease; still working; 815 feet deep. 2 ozs. 2 dwts. per ton.
From 1867 until 1875	"	796	1,534 2½	
	"	98	251 0	
	"	1,368	2,920 2½	
	"	579	3,108 4½	
From 1867 until 1872	Williams, Sen., and party.	579	3,108 4½	Williams' Gold Mining Company (limited); 6-acre lease; worked on tribute, but no sinking carried on; 635 feet deep. 5 ozs. 6½ dwts. per ton. Thickness of reef, from 6 inches to 2½ feet.
1872	"	400	2,455 11	
1873	Williams' Gold Mng. Company (limited.)	1,554	4,018 11	
1874	"	180	144 18	
From 1874 until 1876	"	2,114	15,363 0½	
March, 1876	"	4,807	25,560 5	
		110	528 16	North Williams Gold Mining Company (limited); an 11-acre lease; depth 590 feet, not sinking, but the last crushing a great improvement; paid several dividends. 1 oz. 12 dwts per ton; now improving.
1874	"	3,753½	7,196 16	
1875	"	566	821 17	
March, 1876	"	827	1,183 9	
May	"	576	380 16	
July	"	295½	164 8	
September	"	323	113 8	
November, 1877	"	288	337 6	
February	"	6,728½	10,728 10	

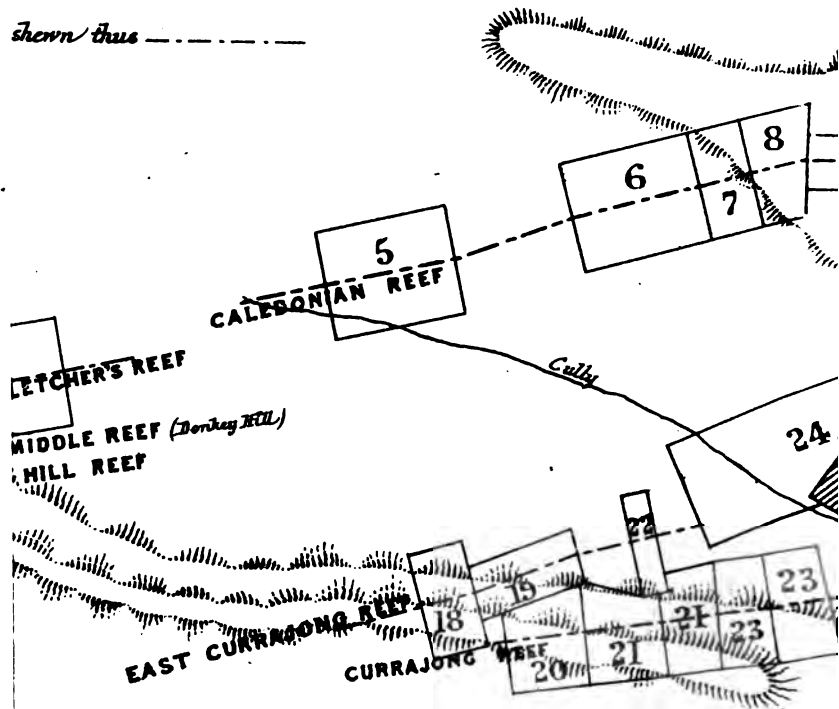
In addition to the foregoing, some very good crushings have been obtained from the Caledonian, Currajong, Donkey Hill, and other reefs.

MINES AT ADELONG

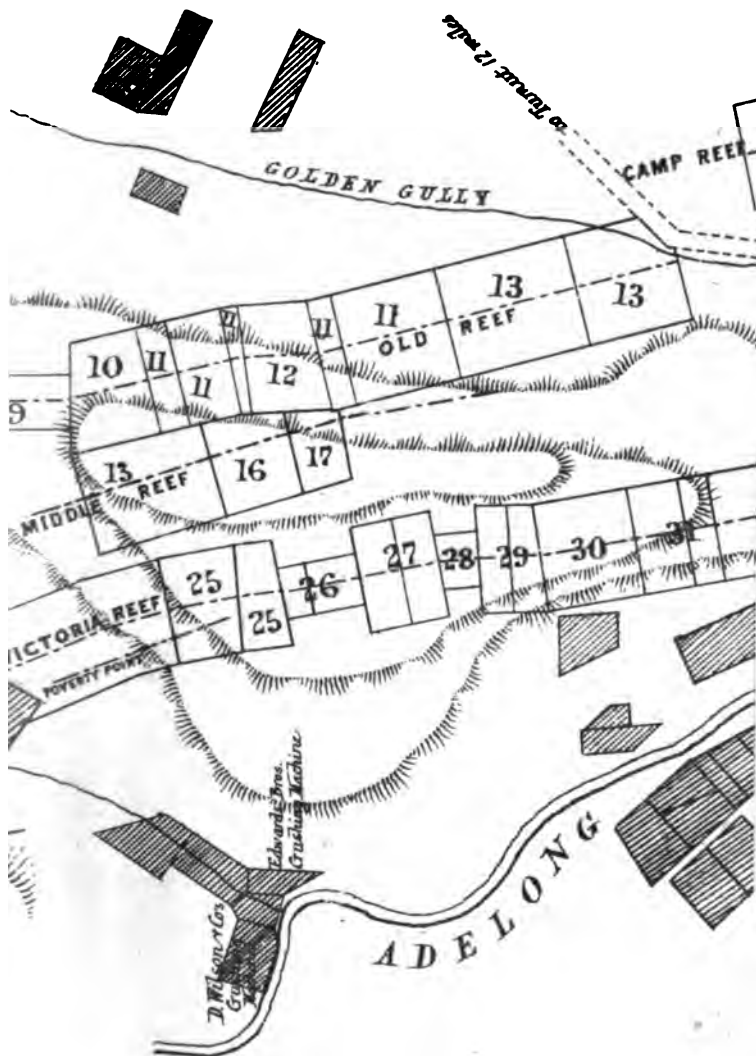
ECTOR OF MINES.

TO AN INCH.

shown thus -----



9. "Old Reef" G. M. Co.
10. "Crown of Old Reef" G. M. Co.
11. "The Adelong United" G. M. Co.
12. "Our Own" G. M. Co.
13. "Welcome Home" G. M. Co.
14. "Camp Reef" G. M. Co.
15. A. Bruce.
16. R. Rogers.



17. *Hamilton*
18. *M. Hodge and party*
19. *R. E. Thomas and party*
20. *N. Emanuel*
21. *"Currajong" G. M. Co.*
22. *W. Hendon and party*
23. *D. Wilson and party*
24. *"Leviathan" G. M. Co.*

As the following information, gathered by me, might be of public interest, I append it to my report on the Adelong mines.

The quartz on the Adelong Gold-field is so strongly impregnated with pyrites and mundic that extraordinary skill and care is required to treat this mundic stone.

Years ago a Commission of scientific gentlemen visited Adelong for the purpose of making inquiries as to the best means to be adopted to not only separate and save the gold from the mundic but also to prevent the great loss of quicksilver then taking place, the immediate cause of such loss being the large percentage of sulphur and mundic in the quartz; but very little was done in this matter, so that machine owners were left to their own resources; they therefore tried all sorts of experiments and have gradually improved their machinery so as to adapt them to the peculiar nature of the Adelong quartz. If these machines save the gold in the Adelong District they must be of the same or even greater value in such districts as Grenfell, Hill End, Parkes, &c., &c., where there are hardly any pyrites in quartz as compared with this district.

Williams G. M. C. machine is in connection with the Williams Gold Mining Company (limited) and is under the able management of Mr. Harford. The machinery is worked by waterpower, and is equal to fifty horse-power; there are three batteries, two of six stampers, and one of four stampers; each box is 5 feet long and has four temporary liners or iron plates inside for the double purpose of saving the boxes from wear and retaining the amalgam in the boxes; the liners are taken out every time a crushing is finished; the tables are 10 feet long, 4 feet wide, and have a fall of $1\frac{1}{4}$ inch per foot; there are copper plates over the whole length of the tables; at the end of these are three ripples containing about 200 lbs. of quicksilver; from these ripples the tailings pass over copper plates into two Chilian mills; the wheels of these mills are 5 feet 8 inches in diameter, 9 inches wide, 2 feet 9 inches apart from each other and weigh about 25 cwt. each; the tailings after leaving the Chilian mills pass over the blanketing tables, of which there are three, 12 by 3 feet each. The blanketings are saved and put through the grinding process in two of Denny's pulverisers, which discharge outside instead of inside, as is generally the case. Mr. Harford recommends Denny's pulverisers as a powerful gold-saving machine, and I might here mention that a separate waterwheel drives the Denny's.

Crushing for the public is done by the hour instead of by the ton—8d. per hour for each stamp, or 10s. 8d. per hour for the whole machinery. The parties crushing pay for all loss of quicksilver, and have the option of crushing with screen (gratings) 195 or 169 holes per square inch.

Wilson & Co.'s machine, Messrs. Wilson & Ritchie, proprietors: This machine is on the self-feeding principle and is worked by water-power equal to thirty-five horse-power nominal, but can be worked up to fifty—The machine is beautifully arranged to work with ease all the different gold-saving apparatus; the main iron shaft connected with the waterwheel is 60 feet in length; by this shaft the batteries, Chilian mills, berdans and buddle are worked; each can be disconnected when required without the least interference in the working of the others. The machine has three batteries of five stampers each, and each stamp weighs 7 cwt.; length of boxes, 5 feet 4 inches; inside each box there are four temporary liners or iron plates for the double purpose of saving the boxes from wearing too fast, and for forming recesses or catches to retain the amalgam in the boxes; these iron plates are taken out every time a crushing is finished; length of table 10 feet, width 4 feet, fall $1\frac{1}{4}$ inch per foot. There are four separate copper plates on these tables, the first 4 by 3 feet, the others 4 by 1 foot; at the end of these tables there are three ripples containing about 200 lbs. of quicksilver; depth of ripples 9 inches, 8 inches, and 7 inches respectively; after the tailings leave these ripples they again pass over copper plates into the Chilian mills, of which there are three—one to each battery; the wheels are 5 feet in diameter, 1 foot wide, weigh 30 cwt. each, and are 2 feet 9 inches apart from each other, giving a grinding surface of 400 feet per minute; from the Chilian mills the tailings pass to three blanketing tables; length of table, 13 feet by 3 feet each; the blanketing tables, Chilian mills, &c., &c., are disconnected from each other so as to enable three parties to crush at the one time; from the blanketing tables the tailings pass through concentrating shoots, where the heaviest material is gathered, brought back, and regrinded with the blanketings in the improved berdans. These berdans, of which there are two, have a stationery chaindrag of $1\frac{1}{4}$ foot grinding surface. After the blanketings and tailings pass through the whole process of grinding they run into one of Munday's patent puddles, 24 feet in diameter, with eight arms, eight feeders, and twenty-four scrapers, and work eight revolutions per minute; the light tailings are now allowed to pass into the creek while the pyrites or mundic saved in this buddle is from 2 to 3 per cent., and by assays made in Sydney contain from 9 to 14 ozs. gold per ton.

Messrs. Wilson & Ritchie are now erecting a reverberatory furnace for the treatment of pyrites and mundic. The furnace will be on the principle of that on the New North Clunes Co.'s Mine in Victoria.

The crushing for the public is done at per hour instead of per ton. The machine owner, as at Williams' G. M. Co.'s machine, breaks the quartz at the mill to the proper size for crushing; the cost per hour for fifteen stamps, three Chilian mills, two berdans and buddle, is 10s. 6d. The parties crushing have the option of using the following screens or grating: 195 or 169 holes per square inch.

The following statistics will show the amount of amalgam or gold saved after the quartz has been crushed through gratings 195 holes per square inch, and therefore the public will be able to judge whether it is well to have appliances to treat the tailings after they leave the tables, or to be satisfied with the amalgamating barrel, which is very often the only apparatus by which blanketings are treated at the quartz-crushing machines on different goldfields of this Colony. These amalgamating barrels have no grinding power; they can therefore only gather free gold, and become a farce or deceit as far as the treatment of blanketings and the extracting of gold therefrom is concerned.

TABLE A.

WILLIAMS' GOLD-MINING COMPANY'S QUARTZ-CRUSHING MACHINE.

Name of Party.	Year.	Tons.	Amalgam.				Gold.				Yield at per ton.
			Boxes.	Plates.	Mills.	Denny's.	Total.	Boxes.	Plates.	Mills.	
Williams' G. Mining Company	1875	400	osm. dwts. 4,076 0	osm. dwts. 4,183 12	osm. dwts. 1,184 2	osm. dwts.	osm. dwts. 9,383 14	osm. dwts. 733 0	osm. dwts. 1,377 0	osm. dwts. 394 0	osm. dwts. 2,554 6½
Annett's	1876	138	114 13	624 16	171 11	80 0	990 5	77 8	308 5	57 3	303 16 2 4½
Do.	"	108	286 15	855 10	821 14	97 15	1,511 14	174 17	283 3	107 5	592 0 5 6½

WILSON AND COMPANY'S QUARTZ-CRUSHING MACHINE.

Name of Party.	Year.	No. of tons.	Amalgam.					Gold.					Yield at per ton.	
			Boxes.	Plates.	Ripples.	Mills.	Bardan.	Total.	Boxes.	Plates.	Ripples.	Mills.		Bardan.	Total.
North Williams' G.M.C.	1874	56	osm. dwts. 208 0	osm. dwts. 300 0	osm. dwts. 25 0	osm. dwts. 77 0	osm. dwts. 8 0	osm. dwts. 674	osm. dwts. 109 18	osm. dwts. 130	osm. dwts. 10	osm. dwts. 30	osm. dwts. 2	osm. dwts. 273 18 4 17½
	1875	3,536½	2,698 10	11,529 10	208 5	2,274 15	578 0	20,850 10	2,551 15	4,411	106	508	198	6,770 15 1 18
	1876	2,021	1,969 5	2,271 5	111 5	628 0	151 0	6,741 15	614 5	908	45	211	50	1,328 5 0 18
	1877	279	238 10	454 5	13 10	79 0	14 0	864 5	95 17	161	5	31	4	206 17 1 1½
Great Victoria G.M.C.	1874	806½	557 4	1,120 0	104 1	871 16	83 8	2,236 13	318 3	448	51	148	27	992 3 1 4½
"	1875	961½	1,209 6	4,467 7	119 7	1,090 0	246 19	7,155	532 11	1,787	43	436	80	2,940 10 3 1
"	1876	1,583½	2,001 7	2,815 12	104 14	575 19	115 16	5,680	758 5	1,126	41	230	38	2,198 5½ 1 7½
"	1877	213	531 14	416 1	18 19	92 15	16 15	925 13	138 4	166	7	33	5	263 6 1 12½
Prowse and Woodward's (now Adalong United G.M.C.)	1874	558½	1,349 13	2,005 6	77 10	461 15	73 6	3,973 15	781 13	808	20	186	36	1,825 12 2 5
"	1875	888½	268 6	438 7	13 14	109 18	29 17	991 3	169 10½	196	5	44	10	433 10½
"	1876	889½	96 4	213 1	20 12	59 16	8 4	297 7	57 6½	86	8	24	3	177 6½
"	1877		76 6	36	6 16	33 4	12 4	214 8	33 19	34	2	13	4	85 19

I HAVE the honor to inform you that I have inspected the principal part of the Tumberumba Gold-field, which is almost entirely alluvial; the principal reefs at present working are at Paddy's River, about 25 miles from here, but I saw a gentleman, interested in those reefs, who assured me that all hands had gone to Albury to arrange some matters connected with these reefs, so that I thought it unnecessary to proceed further south than Tumberumba.

The Tumberumba Gold-field consists of large alluvial valleys and high mountain ranges with granite, slate, basalt, sandstone, and diorite formation; the valleys or flats have nearly all proved auriferous and some of them very rich, but are now nearly deserted by the individual miner although there is no doubt that large deposits of gold are still laying undisturbed in these rich but partially worked valleys, but what the individual miner could not accomplish is easily done by capital and good management, by bringing up tail-races with boxes of sufficient capacity to drain and sluice these flats from side to side. As mining is now slowly but surely recovering its proper position the Tumberumba Gold-field will not escape the attention of the *bond fide* capitalist.

There are however a few mining enterprises developing in this district which are worthy more than a passing notice and should be made public; these enterprises are carried on under the supervision of a Mr. Gitchell, a thoroughly practical miner with large experience of ground-sluicing in the Beechworth District, Victoria. This gentleman will do much to raise Tumberumba from its present drowsiness, especially as Mr. Gitchell always takes a large interest and invests his own capital in these mining ventures.

Some of the undertakings carried on by this gentleman are of such magnitude that they must be seen to be believed, as thousands of pounds sterling have been expended with the full knowledge that not one farthing could possibly be returned until the preliminary work, such as cutting tail-races for several hundred yards through solid rock, or driving large tunnels through hills to get a proper fall for the boxes, was performed.

The Mannus Creek Gold Sluicing Company has only three shareholders, Mr. Gitchell being manager and part proprietor. This company's property is about 4 miles west from Tumberumba Township on the Mannus Creek. The company have now been at work two summers and it will yet require several months before they will be able to commence active operations at ground-sluicing; a tail-race has been brought up the rocky part of the creek and boxes laid fully 850 yards in length, the greatest part through very hard solid granite from 12 to 22 feet in depth and fully 6 feet wide; in blasting this rock at least 2½ tons of dynamite were used; the boxes at present terminate at a point of a hill through which a tunnel 6 feet high and 5 feet wide is now progressing; nearly the whole length of the tunnel, about 247 yards, requires blasting; a barren quartz reef 54 feet thick was passed through; the whole tunnel is substantially secured by strong wooden frames overlaid by timber, and the blasting is done with dynamite, the most effective explosive for this particular wet work. The present length of the tunnel is about 187 yards; about 60 yards more will bring the tail-race on the flat proposed to be sluiced; the boxes which are 4 feet wide and 3 feet deep will then be continued through the tunnel, making a total length of 1,100 yards before sluicing operations can be commenced. Although between £8,000 and £9,000 has already been expended on this enterprise the shareholders are confident that, by their method of working and the prospects obtained in shafts sunk by them through the flat, the capital expended will be returned to them many-fold. The average sinking on the flat is about 10 feet through a loose sandy deposit, the whole of which passes through the boxes and is easily sluiced away. 2½ dwts. per 12 feet square will pay working expenses, but it is confidently expected that the ground will average about half an ounce to the 12 feet square. Eight men will be able to clean 1 acre or about 300 times 12 feet square per month. The flat is over 2 miles long and from 100 to 250 yards wide and will therefore take years to work out.

The Burra Gold and Tin Mining Company, Mr. Gitchell manager and part proprietor, has only a few shareholders (Victorians), capital expended, £6,000. This company's property is situated about 5 miles S.E. of Tumberumba township. The company have cut a tail-race fully 1,200 yards and boxes 4 feet wide by 2½ feet deep are laid the whole length of this tail-race. Several hundred yards in length, by an average depth of 15 feet, had to be blasted; there is also a flood-race 1,500 yards long, running into the creek below the boxes. The company has already obtained 1,520 ounces of gold, but at present there is not sufficient water for sluicing operations on such a large scale; they have a flat of 8 miles in length and from 80 to 200 yards wide before them. There is at present opened about 100 yards and I tried several prospects on a shovel and obtained as high as 6 grains, but saw fully 1½ dwt. to the dish taken in my presence. The thickness of the auriferous strata is about 1 foot (sample of which I took for the purpose of sending to the Department of Mines), and overlaid by about 8 feet of sandy loam, easily washed away. The whole of this flat represented a worthless swamp before the tailrace was brought up to drain the water. The flat has been well prospected by the company and they will have from 10 to 15 years work before them with almost a certainty of large returns for their capital invested.

In addition to the gold, about 1½ ton of tin per acre is obtainable.

The Upper Burra Gold Sluicing Company (Mr. Gitchell, manager and part proprietor) has three shareholders; this property is situated about 6 miles due east from Tumberumba township. Everything here is ready for working when sufficient water comes; a tailrace about 680 yards has been cut, fully half of which is through solid granite. Capital expended about £3,500. The flat to be ground sluiced is fully 2 miles long by from 80 to 150 yards wide, with very good prospects. Boxes 3 feet wide and 2½ feet deep have been laid the whole length of the tailrace. There is also a floodrace of 680 yards. The prospects of this company are really good, as in addition to the gold about 2 tons of tin per acre is obtained.

A few months must still elapse before the real benefits of the operations of these companies are felt, but if a few gentlemen in the neighbouring Colony can be found to come here and invest their capital in mining enterprises of such magnitude as the above-mentioned operations, we have plain proof and facts that the gold mines of New South Wales only require the aid of the *bond fide* capitalist to raise them from their present

lethargy, and the false position into which they have fallen through the over-excited and unhealthy state of the public mind a few years since.

There are several creeks or flats in this district which under the system adopted at the Burra and Mannus Mines could be worked with profit, the only requirement being capital and good management.

The Tumberumba Creek has been very rich, and with a capital of from £6,000 to £8,000 judiciously expended, under good local management, would without doubt pay large interest. The creek has only been partially worked as can be seen by the trees now growing in the flat. At present there is about 3 miles of this flat held under lease by Messrs. Kingscote & Co., well worthy the investment of capital; the average sinking would be from 10 to 15 feet; the nature of the ground is loose sandy loam; the wash which consists of quartz pebbles intermixed with slate, granite, sandstone, and basalt is small; therefore the whole would be easily washed away. With a tailrace of about 700 yards and boxes 5 feet wide and 3 feet high a proper fall for the boxes could be obtained for 3 miles, leaving at the end of that distance fully 30 feet from the surface. In the whole length of the tailrace about 380 yards would have to go through hard basalt country; the time required for sixteen men to do this work would be from 8 to 9 months, after which there would be very little difficulty to contend against.

Eight men could run off from 1½ to 2 acres per month, and by the system adopted by the Burra and Mannus Companies, the water does the work of stripping while the men clear away the debris, such as stumps, trees, &c. By this system, and the use of the large boxes, one man accomplishes as much as eight men can possibly do under the ordinary process of sluicing. There cannot be any doubt that large patches must have been left by the individual miner as by no plan but that of thorough drainage could they effectually work such water-soaked ground as that of the Tumberumba Creek, and such drainage can be accomplished only by bringing up a tailrace with sufficient fall, and boxes of large dimensions, such as I have mentioned.

There are several flats on this southern gold field which could be worked with profit, and I have no hesitation in saying that they will be looked after ere long. As the facilities for ground sluicing in this district are great, and the success of the Burra and Mannus Mines must draw public attention to the fact that mining is not such a reckless and uncertain venture, provided capital is judiciously laid out under a local manager who has ability, forethought, and long practical experience to guide a new undertaking through the first and greatest difficulties.

Many otherwise good mines have been ruined for want of actual capital and good local management, although it cannot be denied that many mines have been misrepresented by unscrupulous persons.

The general opinion expressed here is that most of the gold obtained from this district finds its way over the Borders to Victoria to avoid the export duty. I am informed the extra price obtained is about 2s. per oz.

I HAVE the honor to inform you that I have visited and inspected the Lac-ma-Lac Gold Mining Company's mine, Mr. Phillip Davies, manager.

This company's property is situated about 14 miles east of Tumut. The country is of granite formation. The veins at present opened are two in number. The quartz lays in small bunches, barely averaging 6 inches in thickness.

A crushing of 18 ounces per ton has been taken from one of these veins, and Mr. Davies, who had charge of this mine for the last twelve months, and who is the discoverer of the vein the company is now working, has crushed as much as 3 ounces per ton. The greatest depth obtained in the mine is 163 feet, but at this level the water is rather strong, but as there is not surface water enough at present to work the pump, which is worked by water-wheel, active operations are suspended at the lowest level, and work is carried on on the new vein at and above the 100-foot level.

A crushing plant of 10-horse power is connected with this mine, and erected close to the workings. Only a five-stamp battery is at work, but the woodwork is in proper position for the speedy erection of another five-stamp battery should the necessity occur for the requirement of same.

The manager, acting on the advice given in Guido Küstel's book on the extraction of silver and gold, has fixed copper-plates inside the box, front and back; the front plate is about 3 inches, and the back plate 4 inches wide; but wherever the thickness of the box would allow it these plates should be at least 1 inch wider; they are almost horizontal, with but a slight incline towards the stamps. By this simple means a far greater amount of amalgam is kept inside the boxes than otherwise would be the case, and I think if this system was more generally adopted a great deal of gold would be saved, especially at those machines which have no grinding machinery to treat their tailings.

The gold at the Lac-ma-Lac is very fine; still nearly three-fourths of the amalgam is retained in the boxes through these copper plates; the cost is small, the fixing simple, and the cleaning of the plates, which are temporary fixtures, very easy.

The following shows the amount of amalgam and gold saved in the boxes, ripples, and plates :—

Name of Party.	Date.	Tons.	Amalgam.				Gold.				
			Boxes.	Plates and Ripples.	Chillian Mills.	Total.	Boxes.	Plates and Ripples.	Chillian Mills.	Total.	Yield per Ton.
Lac-ma-Lac Gold Mining Company.	1876.		oz. dwt.	oz. dwt.	oz. dwt.	oz. dwt.	oz. dwt.	oz. dwt.	oz. owt.	oz. dwt.	oz. dwt.
	Dec. 12	25	56 10	14 10	1 17	72 17	30 3	6 0	0 15	36 18	1 18
	" 22	32	191 0	42 10	10 0	243 10	80 5½	17 0	4 0	101 5½	3 3¼
	1877.										
	Jan. 18	50	220 3	35 13	24 0	279 16	97 6	14 0	9 0	120 6	2 8
	Feb. 3	30	186 10	28 14	23 6	238 10	73 8	11 0	9 0	93 8	3 2¼
	" 27	53	93 16	24 15	9 17	128 8	36 10	8 0	3 0	47 10	0 18

I have also visited the Great Britain Tin and Gold Mining Company, Sandy Creek.

This property is situated on Sandy Creek, 4 miles south-east of Lac-ma-Lac. There are only four men at work. The Sandy Creek has formerly been very rich, and there is no doubt if a proper system of working this mine was adopted it would not fail to give a fair return for capital invested; but unless managers and shareholders take into consideration the best means in saving time and labour, and erect or construct their gold-saving appliances accordingly, they cannot expect to succeed.

The following principles should be observed in the undertaking of new ventures for sluicing purposes, when the whole length, breadth, and depth of an auriferous area is to be sluiced :—

1. To get a proper and sufficient fall in their tailraces for boxes of large dimensions.
2. To have a large flow of water, to keep the tailrace clear and in working order.
3. To have small wash, which will easily run off, and to strip the ground by water power.

Wherever this can be accomplished a very small amount of gold will leave a profit, but in every case system and economy should be secured, under the supervision of good practical local management; if this is done many mines, now considered worthless, would give fair returns for capital and labour invested.

I HAVE visited and inspected the Snow-ball Copper Mine.

This property is situated midway in a direct line between Gundagai and Adelong, and consists of an 80-acre mineral lease. Mr. James C. Marten, manager.

Four shafts have been sunk on the lode, but the deepest shaft which is still sinking is about 90 feet deep, and shows a lode of yellow and black-coated yellow ore, fully 8 feet thick.

An adit, the total length of which will be 228 feet, is now being carried through the hill, to intersect the lode at the depth of 126 feet from the surface, from this adit the lode is to be worked. By present appearances the prospects of this Company are excellent. The gossan shows along the surface for nearly 1,000 feet, but the lode is only opened for about 100 feet in length. Assays made in Sydney show the poorest yellow oxide 7½ per cent., yellow oxide, with little steel grains, 19½ per cent., black-coated yellow oxide, 22½ per cent., and the blue and green carbonates, 22½ per cent.

A shed is now in course of erection for the purpose of covering two furnaces, but only one furnace is to be erected at present; the firebricks and all necessary materials are on the ground waiting the arrival of skilled labour from Sydney.

There are about thirty men employed, but as soon as the furnace is erected that number will be greatly increased.

The present shareholders (only few in number) have had possession only about 14 months, although the mine was taken up by other parties during the mining excitement.

This is another proof that our mineral and gold mines are now steadily recovering, and that what large companies, with a nominal capital could not accomplish, is now being done by a few shareholders, who have actual capital, combined with energy and perseverance, to develop their mines.

INSPECTION OF MINES—(REPORT OF INSPECTOR.)

I HAVE the honor to inform you that so far as I have had an opportunity of forming an opinion of the Regulations framed for the Inspection and Regulation of Mines, have so far worked very satisfactory. Regulations 4, 8, and 9 are very simple and decisive, and wherever I have been since these Regulations came in force, and even where my duty compelled me (when no notice of my verbal request had been taken) to serve notice in writing, mining managers, miners, and shareholders, although often put to extra expense, have always, as with one mind, expressed the opinion that these Regulations were the best ever issued by the Government of New South Wales.

On my arrival on Hill End some of the mines were in a deplorable state concerning the safety of human life, which often compelled me to be very decisive and determined; therefore independent of verbal requests; several notices in writing (copies of which were duly forwarded to you) were served by me upon mine-owners, for the purpose of having several defects in their mine remedied within a time named—which requests have always been complied with, and I have never had any cause to take legal proceedings.

In connection with dangerous and unprotected shafts the mine-owners of Hill End considered the Municipality had a right to look to these matters, whereas the Municipal Council thought the Government should, and accordingly Mr. Warden Sharpe was continually bothered by all parties to get these shafts covered over or filled up by Government.

I considered that regulation 4 gave me full power to compel mine-owners to cover over or fill up these unprotected shafts, as long as they were in connection with their mine. With the exception of a few instances, where I had to give notice in writing, between seventy and eighty of these shafts were covered over and filled up on Hill End on my verbal request.

At Adelong I have made inquiry at every mine I have visited, although I have already served notices to some mine-owners to have some defects connected with their mine remedied; they have nevertheless acknowledged the justice of bringing these Regulations in force, and the general expression here is that the Regulations are appreciated by those connected with practical mining.

Regulation 4 (the principal one of the whole) undoubtedly gives an enormous power to an Inspector of Mines, but without such power the office of an Inspector of Mines would be a mere farce, but as such officer must, to a certain extent, have not only a full knowledge of everything connected with practical mining, but also of the miner and his habits, so as to enforce due respect, there cannot be any fear that this Regulation will be abused, as no Inspector could possibly keep his office for any length of time, whose practical knowledge of mining, tact, energy, and judgment, were defective, and who could not form a sound opinion as to when, where, and how certain defects in or about a mine should be remedied.

The regulation ensures safety to the health and life of the working miner, they strengthen the hands of the Mining Manager against the false economy of directors, they protect the shareholder in having his mine kept in a secure state for future development, and they compel tributors to keep the mine under their charge in a secure and workable state.

These are the opinions I have formed of the working of the Regulations, and these are the opinions of most of those with whom I have come in contact in the performance of my duty, of men generally well versed in practical mining matters.

Part (e) of rule 3, to which some objection has been taken, is to a certain extent very useful; it might not prevent miners from drawing a shot which has missed fire, as they would rather do so than to drill a hole close by the fire-missed shot for fear of vibration of drilling causing explosion. But against this argument is the fact that this rule is a strong antidote to missing shots. As long as this rule is in force the miner will only use good fuze, the men will be careful in loading, and should a shot miss fire and be drawn it would be done in the most careful manner possible, to prevent accidents, the possibility of which would entirely rest on their own shoulders. Some advocate the cancellation of part (e) of rule 3 so as to leave it an open question, which perhaps would do, but others wish to have a rule not to allow a shot to be drawn for three or four hours after the same has missed fire; this would be oppressive to shareholders, as by these means a company would lose three or four hours of all the men employed in the level where a shot had missed fire.

Rule 4 would work better if amended thus. Instead of the words, "For keeping such mine free from water," it should be "And shall be kept free from water."

Rule 22 is objected to on the ground of compelling every miner to be supplied with a copy. I think a copy posted on the mine would be sufficient. The complaints enumerated by me are the only ones I have heard or am aware of.

COAL AND SHALE.

TABLE compiled from Returns furnished by the Owners of Collieries, showing the quantity and value of Coal and Shale won during the year 1876, and the number of Miners employed in the Collieries.

Company.	Locality.	Miners Employed.			Quantity.	Value.	Remarks.
		Above Ground.	Under Ground.	Total.			
COAL.							
Australian Agricultural.	Newcastle	85	708	788	Tons. 230,114	£ 147,711 s. 7 d. 8	
Waratah	"	20	114	134	101,646	59,310 18 0	
South Waratah.....	"	40	45	85	1,661	988 0 0	
Newcastle Wallsend	"	110	610	720	167,642	111,038 5 0	
Co-operative.....	"	69	381	450	179,536	108,092 10 0	
Lambton	"	32	359	391	160,990	103,304 0 0	
New Lambton	"	46	258	304	58,987	36,910 18 6	
Duckenfield	"	85	224	309	95,000	59,000 0 0	
Newcastle .....	" .....	...	...	...	.....	.....	Idle.
Little Red Head ...	" .....	...	...	...	.....	.....	"
Red Head.....	" .....	...	...	...	.....	.....	Boring in progress.
Brown's.....	" .....	...	...	...	.....	.....
Nott, Ward, & Co...	Four-mile Crk.	...	...	...	.....	.....	Idle.
Inganees	"	4	12	16	7,241	1,810 5 0	
Sunderland .....	" .....	...	...	...	.....	.....	"
Bloomfield	"	1	2	3	1,264	283 8 0	
Jesmond	"	1	1	2	150	75 10 0	
Greta Coal & Shale	Maitland	25	110	135	19,700	13,790 0 0	
Anvil Creek	"	18	77	95	32,800	21,328 0 0	
Stony Creek	"	1	2	3	200	80 0 0	
Rix's Creek	Singleton	1	1	2	580	338 0 0	
New Wallsend	Catherine Hill	7	36	43	5,020	2,510 0 0	
Bulli	Bay.	92	177	269	101,709	76,281 15 0	
North Bulli	Illawarra .....	...	8	8	.....	.....	Engaged in preliminary works.
Mount Pleasant ...	"	33	95	128	51,575	21,679 7 0	
Osborne Wallsend..	"	34	87	121	47,000	22,344 0 0	
Mount Kembla.....	Wollongong ...	2	...	2	.....	.....

COAL—continued.

Company.	Locality.	Miners Employed.			Quantity.	Value.	Remarks.
		Above Ground.	Under Ground.	Total.			
COAL—contd.							
Lithgow Valley ...	Hartley	3	17	20	Tons. 11,300	£ s. d. 3,478 3 4	Idle.
Esk Bank	„	4	26	30	28,702	7,876 2 0	
Bowenfells	„	2	8	10	7,528	2,634 16 0	
Vale of Clwydd ...	„	3	12	15	9,523	2,400 0 0	
Bulkeley and Cocks	Wallerawang...	...	1	1	50	30 0 0	
Brereton's	Berrima.....	...	...	...	.....	.....
Rock Roof .....	„ .....	...	...	...	.....	.....
Mount Wingen.....	Murrurundi ...	...	...	...	.....	.....
		718	3,366	4,084	1,319,918	803,300 5 6	
SHALE.							
New South Wales	Hartley Vale...	17	52	69	15,598	46,794 0 0	
Shale & Oil Co.							
Joadja Shale Mine..	Berrima	8	6	14	400	1,200 0 0	
		25	58	83	15,998	47,994 0 0	

Department of Mines,
Sydney, 5th March, 1877.

HARRIE WOOD.

REPORT OF THE EXAMINER OF COAL FIELDS FOR THE COLONY OF NEW SOUTH WALES FOR THE YEAR 1876.

IN accordance with the provisions contained in the 26th section of the "Coal Mines Regulation Act 39 Victoria No. 81," I have the honor to submit the following information in respect to the condition and prospects of the various coal mines of the Colony for the year 1876. And also to submit a Report from the Inspector of Collieries for the half-year ending 31st December last.

Ventilation.

During the past year great improvements have been made in the ventilation of several of the collieries requiring it, by increasing the quantity of air entering and circulating therein, widening, clearing, enlarging, and improving the air-courses, making extra stoppings, and other very necessary improvements.

Some of the collieries are still making alterations for giving an additional quantity of air, and improving its circulation through the workings, and I am in hopes that my next Report will state that all the improvements now going on have been completed.

Fatal and non-fatal accidents.

In the half-year ending 30th June last there were three fatal and six non-fatal accidents, and in the half-year ending 31st December, 1876, one fatal and two non-fatal accidents, making four fatal and eight non-fatal accidents in the year,—ten of which happened from falls of coal, one from falling down a shaft, and the twelfth by drowning through falling into a pump hole into which the deceased was at the time of the accident employed guiding the water buckets at the bottom of the new Glebe pit. All the accidents from falls of coal occurred either through negligence or want of foresight in the unfortunate sufferers not securely propping or spragging the coal notwithstanding they had plenty of timber at hand.

In the year 1875 there were eight fatal and ten non-fatal accidents, and it is very gratifying for me to have to report that although the returns show more men employed in the collieries in 1876 than in 1875, there was last year a considerable decrease in the number of accidents.

Special Rules.

With the exception of two collieries, the Special Rules transmitted to me have been submitted to the Minister with my report thereon, and most of them have been Gazetted, and are now in force at the different collieries. The manager of the Lambton Colliery, however, is the only one who has not sent me new special rules, in accordance with the provisions of

the 13th section of the Coal Mines Regulation Act. I wrote to him respecting them on 11th September, 3rd October, and 16th November last, but his reply to my last letter was that he is "in communication with the head office (mining) anent new rules," although I had previously told him that the Act requires him to transmit his rules to the Examiner. I wrote him again on the 23rd instant, and shall take further steps if necessary to secure a compliance with law.

Quantity and value of coal raised.

The quantity and value of the coal raised in the different districts during the year, according to the returns forwarded me from the Mining Department, is as follows:—

NORTHERN DISTRICT.

NEWCASTLE.

Bituminous Coal used for steam, household, smelting, gas, blacksmith, and coking purposes.

	Tons of round and small coal.	Value.
		£ s. d.
Australian Agricultural Company's Collieries	230,114	147,711 7 8
Co-operative Colliery (William Laidley, Esq.)	179,536	108,092 10 0
Newcastle Wallsend Colliery	167,642	111,038 5 0
Lambton Colliery	160,990	108,804 0 0
Waratah Colliery	101,646	59,810 18 0
Duckenfield Colliery	95,000	59,000 0 0
New Lambton Colliery*	46,390	29,023 3 6
South Waratah Company	1,661	993 0 0
Jesmond Colliery	150	75 10 0
Total quantity and value in 1876 (say less 15,000 tons for New Lambton incomplete Return)	983,129	618,548 14 2
Total quantity and value in 1875	1,075,269	680,650 1 6
Decrease in 1876	92,140	62,101 7 4

* Incomplete return only from 18th March to 31st December.

And if we add to this 15,000 tons, valued at £9,674, for assumed quantity raised at New Lambton Colliery from 18th March to 31st December, we shall only have a decrease of 77,140 tons, valued at £52,427 7s. 4d.

Considering the general depression during the past year in the coal, iron, and other trades throughout the whole world, I think the Newcastle people have less reason to complain at the small decrease in the output of coal from the Newcastle Collieries than many places in England and America, &c., where great reductions have been made in the men's wages and price of coal, whilst in their district the wages and selling price remain the same as they were in 1875. And it is gratifying to know that within the last three days thirty-one vessels (exclusive of coasters), with a tonnage of 10,619 register, entered the harbour; and now that the iron and coal trade has an upward tendency in Great Britain we have very good reason for expecting this year will show an increase in our coal trade and in the general prosperity of the district.

The following Statistical Return, furnished me from the Customs Office at Newcastle, shows that the greatest yearly decrease in the export of coal from this port has been. To Hongkong, 22,849 tons; Manilla, 15,700 tons; Java, 12,986 tons; South Australia, 10,499 tons; and coastwise, 58,838 tons;—and the greatest yearly increase. To Victoria, 16,804 tons; Tasmania, 7,831 tons; and New Zealand, 6,408 tons.

New South Wales—Port of Newcastle—Export of Coal.

To Foreign and Intercolonial Ports.	Tons—1875.	Tons—1876.	Increase.	Decrease.	Total decrease for 1876.
Victoria.....	232,656	249,460	16,804	.....	.....
New Zealand.....	140,520	146,928	6,408	.....	.....
South Australia	98,185	87,686	.....	10,499	.....
Tasmania	14,449	22,280	7,831	.....	.....
Queensland	5,664	6,064	400	.....	.....
San Francisco	96,336	88,522	.....	7,814	.....
Hongkong.....	58,122	35,273	.....	22,849	.....
China.....	13,658	11,704	.....	1,954	.....
Mauritius	6,030	4,311	.....	1,719	.....
New Caledonia.....	3,968	4,183	215	.....	.....
Japan.....	7,495	3,656	.....	3,839	.....
Manila	19,856	4,166	.....	15,700	.....
India.....	20,672	21,778	1,106	.....	.....
Guam	8,971	5,859	.....	3,112	.....
United States	1,178	2,223	1,045	.....	.....
Callao	2,126	.....	.....	2,126	.....
Valparaiso.....	1,970	480	.....	1,490	.....
Honolulu	1,496	2,868	1,372	.....	.....
Tahiti.....	395	.....	.....	395	.....
Java.....	20,190	7,204	.....	12,986	.....
Petropaulovski	12,758	10,171	.....	2,587	.....
Padang	3,938	3,465	.....	473	.....
West Australia.....	500	.....	.....	500	.....
Fiji .....	.....	260	260	.....	.....
Bangkok .....	.....	509	509	.....	.....
	771,143	719,050	35,950	88,043	52,093
Shipped Coastwise	304,948	246,116	.....	.....	58,838

QUEEN'S WHARF, PORT OF NEWCASTLE.

The Queen's Wharf has been greatly improved and extended, and more powerful steam cranes erected, giving every facility for quickly loading ships of the largest class.

BULLOCK ISLAND WHARF, PORT OF NEWCASTLE.

2,000 feet in length of the projected $1\frac{1}{4}$ -mile Wharf has been completed, a railway to connect it with the Great Northern Railway and Collieries, and all the necessary branches therefrom to four hydraulic cranes, each capable of lifting 15 tons and shipping 800 to 1,000 tons in twelve hours.

For working these cranes, and others proposed to be erected on this wharf, a large engine-house, with accumulatory towers, and all the latest improvements and appliances, is rapidly drawing towards completion under the direction of Mr. C. W. Darley, resident engineer for Harbours and Rivers.

The cranes, accumulators, and all the appliances for hydraulic purposes, have been obtained from and manufactured by Sir William Armstrong and Company. It is expected that everything will be completed, to enable the Government to ship coal from the four cranes in March next.

NORTHERN DISTRICT.

BRANXTON, FOUR-MILE CREEK, RIX'S CREEK, AND STONY CREEK.

Splint and bituminous coals used for steam, household, gas, blacksmith, and coking purposes.

	Tons of round and small coal.	Value.		
		£	s.	d.
Anvil Creek Colliery	32,800	21,328	0	0
Greta Coal and Shale	19,700	13,790	0	0
Inganee Colliery (Mitchell's)	7,241	1,810	5	0
Bloomfield Colliery	1,264	283	8	0
Rix's Creek	580	338	0	0
Stony Creek	200	80	0	0
Total quantity and value in 1876.....	61,785	37,629	13	0
" " 1875.....	81,010	45,073	14	2
Decrease in 1876	19,225	7,444	1	2

The decrease in this district occurred through the Greta Colliery only working a few months during the year.

NORTHERN DISTRICT.

CATHERINE HILL BAY, NEAR LAKE MACQUARIE.

Splint and bituminous coal used for steam, household, smelting, and blacksmith purposes.

	Tons of round and small coal.	Value.		
		£	s.	d.
New Wallsend Colliery Company.....	5,020	2,510	0	0
Total quantity and value in 1875.....	4,380	3,066	0	0
Increase in quantity in 1876.....	640	1,556	0	0*

* Decrease in value in 1876.

SOUTHERN DISTRICT.

ILLAWARRA.

Semi-bituminous coal, used for steam, household, smelting, and blacksmith purposes.

	Tons of round and small coal.	Value.		
		£	s.	d.
Bulli Colliery	101,709	76,281	15	0
Mount Pleasant Colliery	51,575	21,679	7	3
Osborne Wallsend Colliery	47,000	22,344	0	0
Total quantity and value in 1876	200,284	120,304	12	0
Total quantity in 1875	149,327	*		
Increase in 1876	50,957	.....	

* Value not known on account of Bulli Company not giving it.

These returns for 1875 are taken from those sent in to me from the different collieries.

From the above it will be seen that there is a very large increase in the output of coal from the Illawarra District in the past year over that of 1875, which augurs well for the future prosperity of the coal trade in this locality. The coal is cheaply and easily wrought, and it is only the want of greater shipping facilities or railway communication with the metropolis that prevents the output of coal from this extensive coal field increasing at a much more rapid rate.

Coke and Coke Ovens.

Messrs. Osborne and O'Hearn have erected several coke ovens near the Wollongong harbour and sold some good coke, made of slack procured from the Osborne Wallsend Colliery. The ovens are idle at present through the limited demand for coke, which is principally supplied from the Newcastle district.

Bulli Company's Jetty.

The Bulli Company are making improvements to their jetty, and strengthening it by a number of iron cylinders filled with concrete, several of which at my last visit had been successfully put down by Messrs. Jeffries and Mackenzie.

Mount Kembla Shale and Oil Works.

These oil works and the mine were idle during the year 1876, but the late rise in the price of kerosene oil has induced the Company to commence work again, and they are now manufacturing oil.

SOUTHERN DISTRICT.

Joadga Creek Petroleum Oil Cannel Coal.

Work was only commenced at this mine last year. Messrs. J. De Ve Lamb and others are the owners of it, and it is situated about 12 miles from Berrima, in the county of Camden.

The quantity and value of this rich mineral, similar to the New South Wales Shale and Oil Company's, raised in 1876, was 400 tons, valued at £1,200.

They are at present carting it from the mine to the Great Southern Railway, a distance of from 12 to 14 miles.

WESTERN DISTRICT.

LITHGOW VALLEY, HARTLEY, AND MUDGEE ROAD.

Splint coal used for household, steam, smelting, gas, blacksmith, and coking purposes.

	Tons of round and small coal.	Value.
		£ s. d.
Eskbank Colliery	28,702	7,876 2 0
Lithgow Valley Colliery	11,300	3,478 3 4
Vale of Clwydd Colliery	9,523	2,400 0 0
Bowanfels Colliery	7,528	2,634 16 0
Bulkeley's and Cook's (Mudgee Road)	50	30 0 0
Total quantity and value in 1876.....	57,103	16,419 1 4
Total quantity in 1875	38,812	Value not given.
Increase in 1876.....	18,291	.....

The western returns for 1875 are taken from returns sent in to me from the different collieries.

The quantity of coal used for smelting, steam, household, and other purposes at Lithgow Valley and that sent by rail to Sydney and the west is rapidly increasing, and it only requires the completion of the appliances for the shipment of coal at Darling Harbour, and the further extension of the Western Railway to other copper districts, to very largely augment the output of coal from Lithgow Valley and other places in the Western District.

The Lithgow Valley Colliery Company have during the year increased their plant by importing 50 waggons from England for the conveyance of coal on the Great Western Railway, which will enable them to get quicker despatch for their coal, and as they have obtained the Government contract for the supply of coal for the Great Western and Southern Railways we may anticipate a very large increase in their output of coal this year.

Eskbank Smelting Works.

The Eskbank Smelting Works, on Thomas Brown, Esq's., property, obtain their coal from the Eskbank Colliery, and they have turned out on an average, about 50 tons of refined copper per month.

Vale of Clwydd Smelting Works.

These are new smelting works erected on the Vale of Clwydd Colliery Company's property. They comprise two roasting and one refining furnace, and one lead and silver furnace. When working during the year the copper ore smelted by this company was procured from Eagle Swamp and Armstrong's mine, at Lock's platform, and the coal from the Vale of Clwydd Colliery.

Lithgow Valley Iron Works.

No iron was made by this Company during the year, as they have been erecting rolling mills, puddling furnaces, and a steam hammer for the manufacture of rails and bar iron.

These works are on property leased from Mr. Brown. The coal will be supplied from the Eskbank Colliery, clay-band iron ore from the same estate, whilst it is proposed to bring magnetic and brown hydrated iron ores from the Company's land at Mount Lambie, and hematite ore from their land near Clarence Tunnel, &c.

Lithgow Valley's Company's Brick Works.

Mr. Austin is making very excellent fire, common, and other bricks for terracotta and ornamental work, &c., &c., from fire and other clays existing in great abundance on this Company's property, and they meet with a ready sale in Bathurst and elsewhere.

LITHGOW VALLEY.

The works above-mentioned, houses and other buildings erected in a very short space of time, and those in course of erection, are of such a character that they must make the once quiet village of Lithgow a great and flourishing township.

HARTLEY.

New South Wales Shale and Oil Company.—Petroleum oil cannel coal used for oil and sold for gas purposes, 15,598 tons—value not given—being an increase over that of 1875 of 5,742 tons, according to returns sent me.

NOTICES OF OPENING OUT NEW MINES.

Mr. Ernest Augustus White, on behalf of Messrs. Stokes, White, and Dr. Mackenzie, gave notice on 29th March last, that they were sinking trial shafts at Hexham, with the view of opening out the coal seams in that locality. They have proved one seam near the outcrop, 7 feet in thickness, and are now sinking to it at a greater depth and nearer the Great Northern Railway, and I am given to understand that they expect to reach it in a very short time. They have a lease of 1,500 acres of land at 6d. per ton royalty, and Mr. Philip Winchester is superintending the sinking to the seam.


Brown's Colliery.

On July 19th, 1876, Messrs. J. and A. Brown sent in notice of their opening out another colliery, called Brown's Colliery, on their Duckenfield property, where they have driven in a fine tunnel, erected a winding engine, screens, &c., and opened out the same seam of coal as that worked at the other large collieries in the Newcastle district. They have completed a branch railway from the tunnel-mouth to their Hexham line, which joins the Great Northern Railway, and they are now selling and shipping coal from there.

North Bulli Coal and Iron Company.

On 28th October last I received a notice from Mr. T. W. Garlick, stating that the North Bulli Coal and Iron Company (Limited) were then engaged opening a seam of coal on their property near Bulli, for the purpose of testing the thickness and quality of the seam.

Sections showing seams of coal opened out at various places in the year.



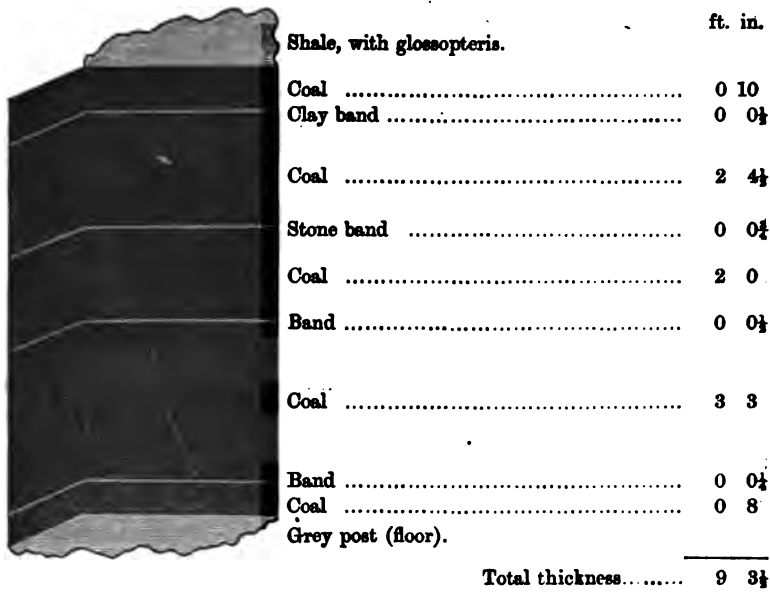
Hard blue shale, with glossopteris, &c. (roof).	ft. in.
Black shale and coal	1 6
Coal, with occasional patches of brass (iron pyrites)	1 6
Band	0 0½
Coal	2 4½
Shale band.....	0 0½
Coal	1 4
Inferior coal (Morgan)	0 4½
Coal	0 7½
Clay band	0 0½
Coal	1 1
Coal inferior (Jerry Wag)	0 8
Coal	2 5
Grey post (floor).	
Total thickness.....	10 5½

This is a section of the seam of coal sunk to and opened out by the Newcastle Coal Mining Company on 1,400 acres of land leased from E. C. Merewether, Esq., at Burwood, near the Glebe, 2½ miles from the Newcastle Harbour by rail, and found at a depth of 303 feet from the surface. The seam is of excellent quality and the same as that worked at the Australian Agricultural, Wallsend, Waratah, Co-operative, Lambton, New Lambton, and Duckenfield Collieries.


This colliery was opened out and the coal won by the late James Baron Winship, Esq., who for fifteen years was colliery viewer for the Australian Agricultural Company, and resigned his appointment there to invest in and open out this colliery, through which we have to deeply regret and feel his loss, as there is very little doubt that if he had not given up his lucrative appointment with the Australian Agricultural Company for the purpose of developing this new and promising coal mine, he would most probably not have been a passenger by the ill-fated steamship "Dandenong" in which he and a great many others found a watery grave. He was returning from Melbourne where he had been to arrange with some of his co-partners matters connected with the new company. Mr. Winship was the colliery viewer for several other

mines, and his large and varied colliery experience in Great Britain and this Colony, his readiness to invest and induce others to invest in mining and other speculations, and his genial nature, tended to make his loss very keenly felt by all classes of the community.

The Company have already sunk two shafts to the lower or borehole seam of coal, erected two 20 horse-power engines, pumping and lifting apparatus, screens, &c., &c., and 100 waggons are ordered from England, sixty of which have arrived in Newcastle; and as soon as the waggons now landed have been put together the Company will commence to ship coal, for which they say they have procured large orders already.



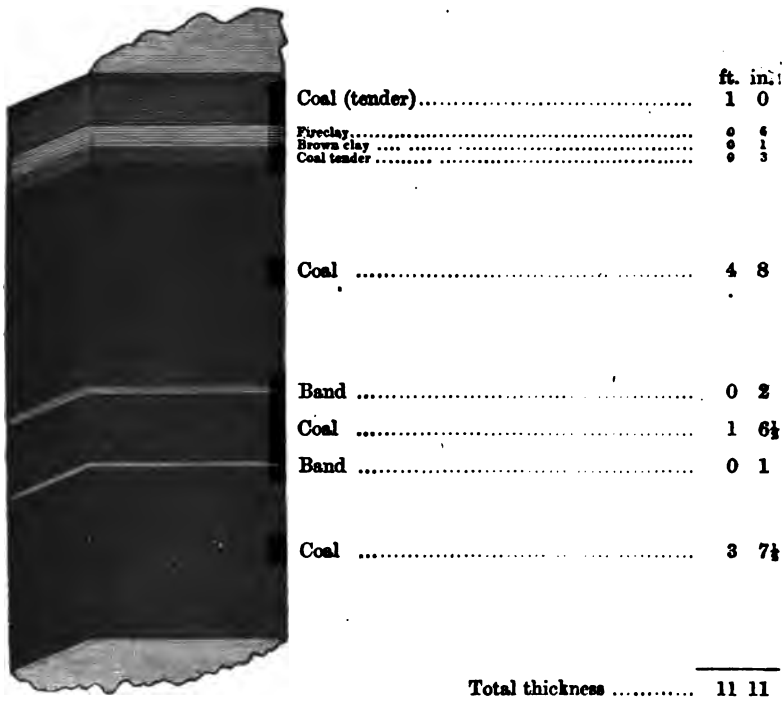
This represents a section of the seam of coal opened out by Mr. Neilson at Dark Creek, and is now being worked from an adit by the Newcastle Wallsend Coal Company. A number of screens, branch railway, and all other necessary appliances have been substantially constructed for increasing the output of coal from this Company's collieries. The seam is identical with that previously worked by them and the other large collieries in the Newcastle District.



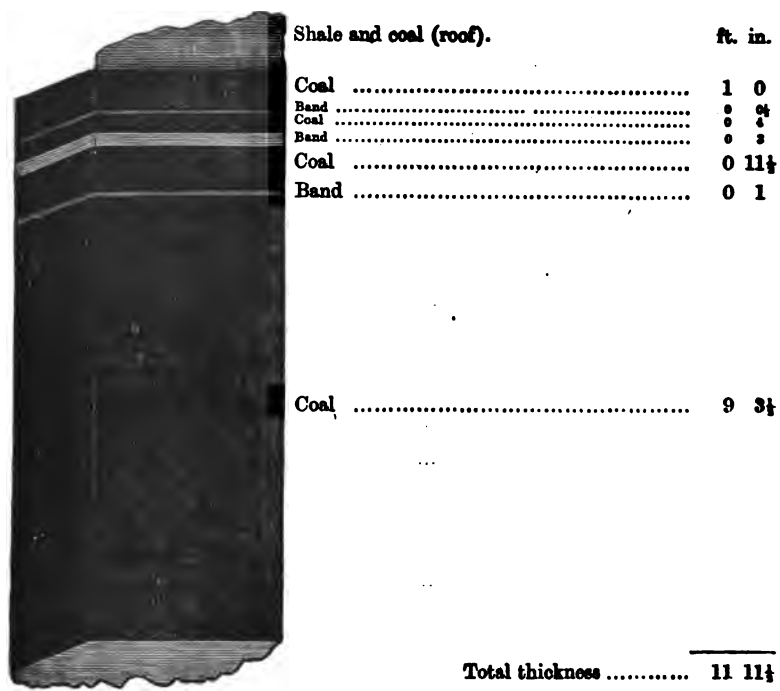
Conglomerate (roof).	ft. in.
Coal	1 9
Indurated clay	0 4
Coal	0 10
Indurated clay	0 2
Coal	4 8
Black shale	0 3
Indurated clay	0 4
Coal	3 10
Black shale	0 6
Coal	3 6
Conglomerate (floor).	
Total thickness	<u>16 2</u>

This is a section of the seam of coal sunk to and now being worked by Mr. Vickery at the Greta B Pit at a depth of 450 feet from the surface.

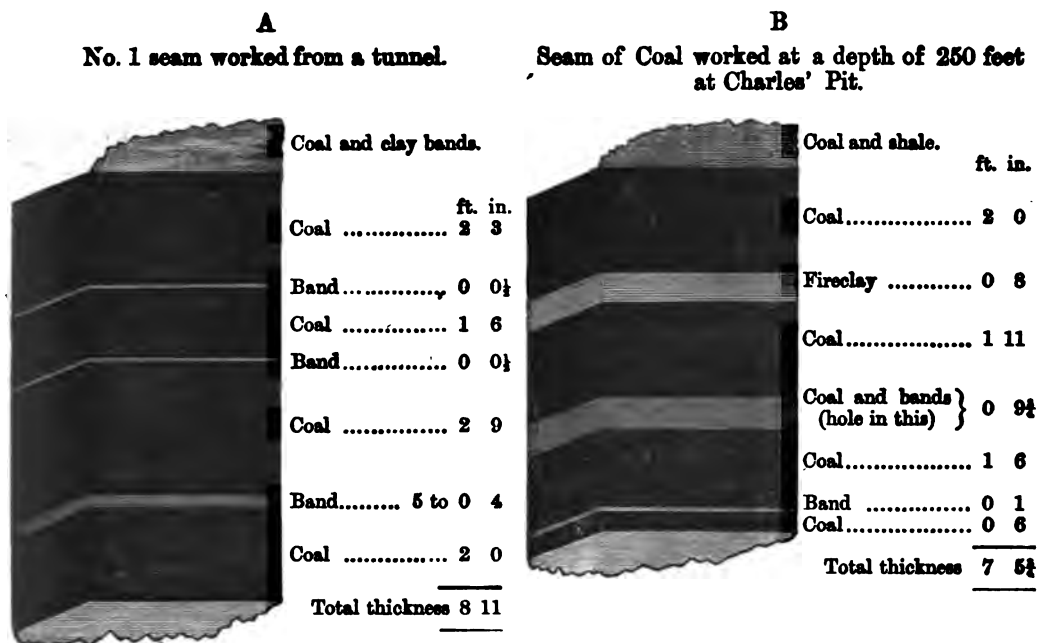
The shaft is 15 feet in diameter, and has all the latest improvements for lifting a large quantity of coal per diem. Mr. Harpur is the colliery manager. In sinking the shaft to the coal a great number of fossil fauna, such as spirifera, producta, conularia, orthoceras, and very large inocerami were found.



This represents a section of a seam of coal 11 feet 11 inches in thickness bored through, and found at a depth of 262 feet 9 inches from the surface by Mr. Fletcher, of the Co-operative Colliery, on Messrs. Pope and Hardie's property, close to the sea-beach at Catherine Hill Bay. This Company have sunk to two other seams of coal in the ranges and land, above sea-level, belonging to them here; one of them is 14 feet in thickness, and identical with that worked by the New Wallsend Colliery Company at Catherine Hill Bay.



This represents a section of the seam of coal bored to and found at a depth of 341 feet 8 inches from the surface by Messrs. Laidley, Smith, and Dibbs, at Stockton, on the north shore and immediately adjoining the Newcastle harbour. The particulars were kindly given to me by Mr. Fletcher, of the Co-operative Colliery, who had the general superintendence and management of the boring operations. It is identical with the Borehole seam worked at the Australian Agricultural, Wallsend, Waratah (old seam) Co-operative, Lambton, New Lambton, and Duckenfield Collieries. The borehole was commenced from the bottom of a shaft sunk and tubbed by Mr. Stevens, who first commenced to sink for the coal at this place.



These sections (given me by Mr. Moody) denote the new seams of coal at South Waratah, opened out by Mr. Moody, and now being worked by the Waratah Coal Company.

The No. 1 section, lettered A, represents the uppermost seam of coal on their property, and is worked from a tunnel; an incline of about 800 yards in length delivers the coal into waggons on their railway alongside the Charles' Pit.

A large township near the mine, called Charlestown, has come into existence since the opening out of it. The seam of coal lettered B is 7 feet 5 inches in thickness, and is the one they are now working at the Charles' Pit at a depth of 250 feet from the surface. The pit is 16 feet in diameter, and the head-gear, engines, pumping apparatus, landing stage, screens, engine-house, blacksmith, carpenter, and other shops, are of the very best construction, and have been well and carefully designed and erected by Mr. Moody, the Manager of the Waratah Company.

Australasia Coal Company.

This Company is now engaged constructing a railway from the Great Northern Railway to the seam of coal opened out by them adjacent to the South Waratah Collieries, and which is identical with the number one (lettered A) at South Waratah. They have nearly completed 4 miles of the railway, and are now driving a heading through the hill in a seam of coal, which heading they purpose enlarging and forming into a tunnel 17 feet high by an average width of 12 feet. Plant and materials are on the ground so as to enable the Company to commence operations as soon as possible after the railway is completed. This is a Melbourne Company, managed by J. Robyns, Esq.

Total quantity and value of Coal raised from all the Collieries in 1876.

Recapitulation, showing the quantity and value of the coal raised from the whole of the Collieries in New South Wales in 1876:—

There were 24 collieries raising coal, and 2 getting petroleum oil cannel coal, and the aggregate production of coal from these Collieries in 1876 was 1,807,821 tons of round and small coal, valued at £795,412.

The aggregate production of petroleum oil cannel coal during the same year was 15,998 tons, the value of which is not given, but we may assume it to be at least £47,994.

I have, &c.,

JOHN MACKENZIE, F.G.S.,

Government Examiner of Coal Fields.

HALF-YEARLY REPORT of the Inspector of Collieries for the six months ending 31 December, 1876, on the state of the various Collieries in New South Wales, and accidents therein.

Sir, **THE EXAMINER OF COAL FIELDS, NEWCASTLE.**

I have the honor to transmit to you this my half-yearly Report on the state of the New South Wales Collieries under inspection, during the six months ending 31st December last, and accidents therein.

The same mines, without any addition or decrease in the number, were under inspection during the time of this Report, as that of my previous one, namely:—

Northern District	20 coal mines.		
Western „	4 „	and 1 shale mine.	
Southern „	3 „		
<hr/>			
Total	27 „	and 1 shale mine = 28.	

I think it to be my duty to state here that the managers of most of the collieries have been induced to introduce at least the minimum quantity of air required by the Act for the whole number of men and horses employed in the mines, regardless of the fact that only one shift of miners are in at a time, except a few hours during changing time.

The calculation on the ventilation of the mines in this Report are in accordance with the above. The Borehole Mines alone work only single shift.

PRESENT STATE OF THE MINES.

A. A. Company's.—Although the Manager is still pushing on the necessary preliminary works for improving the ventilation of the mine I regret having to report that little or no practical benefit is effected as yet in the quantity of air introduced into the mine, which has ranged during the six months from about 88,000 to 42,000 cubic feet per minute for over six hundred men and horses, which is far below the minimum quantity required by the Act. In other respects the provisions of the new Coal Fields Act are being complied with.

Waratah.—There being so many openings to the day in various parts of the mine, the workings are thereby rendered fresh, &c., although the volume of the air currents cannot well be measured. The various provisions of the Act are being carried out.

New Lambton.—The quantity of air introduced into the mine during the six months has ranged from about 20,000 to 27,000 cubic feet per minute, which is below the minimum quantity required by the Act for about 240 men and horses. In other matters the Act is complied with.

Lonsdale.—Only two or three men employed in the mine, which is well ventilated and the Act complied with, except that no special rules are framed. May not the New Lambton rules be used, seeing that the mine is worked under royalty to the proprietors of that mine?

Lambton.—The quantity of air introduced into the mine during the six months ranged from about 68,000 to 74,000 cubic feet per minute, which is considerably over the minimum quantity required by the Act for less than 400 men and horses employed in the mine. The provisions of the Act are fairly carried out in other respects also.

Dark Creek.—Stopped since last October—worked only half the six months.

Wallsend.—From 68,000 to 72,000 cubic feet per minute of air has been introduced into the mine during the six months, which is above the minimum quantity required by the Act for about 500 men and horses employed in the mine. The provisions of the Act are fairly complied with in other matters also.

Co-operative.—The quantity of air introduced into the mine during the six months ranged from about 47,000 to 52,000 cubic feet per minute, which is over the minimum quantity required by the Act for about 350 men and horses employed in the mine. In other respects also the provisions of the Act are carried out.

Duckensfield.—The quantity of air introduced into the mine during the six months ranged from about 21,000 to 24,000 cubic feet per minute, which is rather below the minimum required by the Act for about 280 men and horses employed in the mine. In other matters the Act is complied with.

Alnwick.—Owing to want of trade and other matters very little work has been done during the six months—just keeping the mine open.

Pearce & Co.—Only two or three men getting a little coal on their own account.

Ingaes.—The mine is very indifferently ventilated both as to the quantity of air introduced into the mine and its circulation through the workings. The old trial pits are still unsecured.

Bloomfield.—Only the lessee and another man working. Going on satisfactorily.

Stoney Creek.—Doing next to nothing. No trade.

Anvil Creek.—The quantity of air introduced into the mine during the six months is about 10,000 cubic feet per minute, which is rather over the minimum quantity required by the Act for about eighty men and horses employed in the mine. Other provisions of the Act complied with also.

Greta.—The latest measurement of the air showed great improvement in the quantity introduced into the mine, namely, about 14,000 cubic feet per minute for about 100 men and horses employed in the mine. Other provisions of the Act fairly carried out.

Rix's Creek.—Only lessee working. Both getting and carting the coal.

Glebe.—Still pushing on their preliminary works.

Raspberry Gully.—Driving headings, &c. Not in full work.

New Wallsend.—From ten to twelve men and horses are employed in the mine, and the workings are comparatively fresh, though the air current was so feeble that I was unable to measure it. Otherwise the Act is fairly carried out.

Pulli.—The quantity of air introduced into the mine during the six months averages from about 23,000 to 26,000 cubic feet per minute, which is considerably over the minimum required by the Act for about 150 men and horses employed in the mine. The provisions of the Act are being carried out in other matters also.

Osborne, Wallsend.—About 13,000 cubic feet of air per minute is introduced into the mine, which exceeds the minimum quantity required by the Act for about 100 men and horses employed in the mine. The provisions of the Act are being carried out in other matters also.

Mount Pleasant.—The ventilation of this mine has been deficient for some time; only 3,500 to 4,200 cubic feet per minute of air introduced into the mine during the six months for about eighty men and horses, which is less than half the minimum quantity required by the Act; however I expect the defect will soon be remedied. The other provisions of the Act are being carried out.

Eskbank.—The measureable quantity of air introduced into the mine during the six months averages from about 4,000 to 6,000 cubic feet per minute, which is about double the minimum quantity required by the Act for about twenty-six men, &c. In other respects the provisions of the Act are carried out also.

Bowenfells.—Owing to the large area of the air-ways, and the comparatively small current of air required for the few men, &c., employed in the mine, I could not measure the air current; however the mine is quite fresh, &c.; and the Act carried out in other matters also.

Lithgow Valley.—The air introduced into the mine averages about 6,000 cubic feet per minute, which considerably exceeds the quantity required by the Act for about twenty men and horses. The Act is fairly observed in other matters also.

Vale of Clwydd.—The ventilation of the pit has been greatly improved lately. The last measurement was over 8,000 cubic feet per minute for eight men, &c., employed in the mine. The Act is fairly carried out in other matters also.

Hartley Vale.—Shale.—The quantity of air introduced into the mine ranges from 9,000 to 12,000 cubic feet per minute for about sixty men, &c., employed in the mine. The other provisions of the Act are fairly observed also.

Accidents in Mines.

I feel both pleased and grateful in thus producing the lightest list of casualties of any during the term of my inspectorship, consisting of only one fatal accident to a single person, and two separate cases of serious bodily injuries to two persons. The fatal accident happened to an experienced miner named Evan Davies by a fall of coal in the Waratah Colliery on the 4th December, and the District Coroner, F. J. Shaw, Esq., held a Coroner's inquest on the body on the same day, which I attended after examining the scene of the accident.

The aspect of the place when I examined it confirms the evidence given at the inquest by the three witnesses examined, viz.:—John Wassel and William Mankes, both mates of the deceased, and were in the place when the accident occurred; and Thomas Usher, mine overman.

The place was a two-loose end pillar working, about 4 yards wide, the coal seam 8 feet high, and parting freely on top. About 4½ feet in the middle of the place was holed or undermined into a gray back, and a sprag set against it to secure the hanging coal. The two mates were at the time undermining at each side of the place and the deceased filling the coal skip right in front of the coal, when it broke off suddenly close to the sprag and fell on and killed him on the spot. The overman, Usher, testified to the strict enforcement of the Colliery Rules as to supplying the men with timber, &c., and visiting the workings to see that the men use it to secure the workings, which evidence was confirmed by the other witnesses. The jury found a verdict "Accidental death."

The first of the two non-fatal accidents was a leg-fracture by a fall of coal in the Waratah Colliery; and the second and last non-fatal case was also a leg-fracture by a fall of coal in the Co-operative Colliery.

Several lighter accidents have been duly investigated during the six months.

The usual Tabulated List of Accidents is annexed.

THOMAS LEWIS,
Inspector of Collieries.

TABULATED List of fatal and non-fatal Accidents in the New South Wales Collieries during the six months ending 31 December, 1876:—

No.	Date.	Colliery.	Name of Sufferer.	Occupation.	Remarks on nature and extent of injuries.	Fatal fall of Coal.	Non-fatal fall of Coal.	Total fatal.	Total Non-fatal.
1	Aug. 28	Waratah	Robert Bell..	Miner ...	Leg-fracture by a fall of coal..	...	1	...	1
2	Oct. 10	Co-operative...	John Peters..	do. ...	do. do. ...	...	1	...	1
3	Dec. 4	Waratah	Evan Davies..	do. ...	Killed on the spot	1	...	1	...
Grand Total						1	2	1	2

GEOLOGICAL SURVEYOR'S REPORT.

REPORT OF PROGRESS OF THE GEOLOGICAL SURVEY, DURING THE YEAR 1876.

TO THE UNDER SECRETARY FOR MINES, &C., &C.,—

SIR,

I have the honor to furnish you with the Report of Progress of the Geological Survey for the year 1876.

From the commencement of the year until the 12th April, I was engaged upon official work in the department in Sydney.

The mineral and geological collection which, by your direction, I had the honor of arranging for the representation of the mineral resources of New South Wales at the Centennial Exhibition recently held in Philadelphia was completed and dispatched on the 11th February.

It is very gratifying to learn that our exhibits were a source of considerable attraction, and that they have well served the intended object of their display, by affording to the visitors from all parts of the world some reliable evidence of the vast mineral wealth of this rich British province, and thus presenting to their view the extensive field which here lies open for enterprise and the investment of capital.

The more scientific portion of the exhibits—the fossil fauna and flora, characteristic of the various geological formations of New South Wales—could not but prove highly instructive.

The following statement is copied from the Judges' report in Group I :—

“ Department of Mines, Sydney, New South Wales, mineral and geological collection and collection of copper and gold ores.

“ *Report.*—Commended for the fine, large, and well arranged collection of ores and organic remains illustrating the economic mineralogy and the palæontology of New South Wales, also for the purity of the copper, importance of the production, and the number and classification of the gold ores and tailings.”

Mr. Charles Robinson (to whom is due our best acknowledgments of his energetic labours in carrying out his arduous duties as Secretary to the New South Wales Commission), writing from Philadelphia, informs me that the above report of the judges “ is the longest and most eulogistic of any which appear respecting mineral exhibits from Australia.” * * * “The

New South Wales Mineral Department is pre-eminent among British Colonies. The tin specimens are particularly interesting: And I have heard many people say we make one of the best shows in the Exhibition. * * * I hear but one opinion about the mineral exhibits of the New South Wales Court, and that is most flattering. New South Wales and Queensland have created an almost universal impression that they are two of the richest countries under the sun. "The Americans are intensely practical, and think more of our minerals, woods, &c., than of the highly finished productions of France or Belgium." I have quoted this, not exultingly in regard to our sister Colonies, but in order to show that our representation of the mineral resources of this province was, to say the least, considered satisfactory, and in connection with the other exhibits forwarded from New South Wales, must have tended to bring this Colony prominently under notice.

At the beginning of the year the geological collection belonging to the Department of Mines numbered about 2,500 specimens, from which 748 labelled samples, comprising some 900 specimens, were assorted and sent to Philadelphia; the remainder were then classified and arranged in the Museum of Mines.

During my recent tour of inspection through the gold fields I procured a good collection of rocks, minerals, and fossils, characteristic of the formations from which they were taken; with these and others received from private contributors (whose names are mentioned in the appendix), the Museum of Mines now contains upwards of 5,000 specimens.

The Museum was opened for admission to the public, for the first time, on 6th March.

The frequent visits of persons seeking information as to the value and modes of occurrence of the metallic ores, &c., testify to the appreciation of the public for this important branch of your department.

On the application of Mr. J. H. Keys, J.P., President of the Upper Hunter Pastoral and Agricultural Association, a suite of minerals and fossils was forwarded from the department on the 13th March to the Exhibition of that Society at Muswellbrook.

Another instructive collection was also arranged for the Annual Exhibition of the New South Wales Agricultural Society, held in Sydney in April. It is believed that these exhibitions will tend to remove the existing depressed state of the mining industry, caused by the reckless investment of capital during the late mining excitement, and will give assurance of the permanence and value of the mineral wealth of the Colony.

On 22nd March I inspected the water reserve at Penrith, and reported as to the reservation, for road metal, of those extensive beds of gravel deposited by the Nepean River along its channel during flood time.

From the 13th of April to the end of the year I was engaged on an examination of several of the principal gold fields, for the purpose of revising the boundaries of the gold fields reserves, and of reporting upon the auriferous character of certain lands under application for purchase.

Special reports upon these matters I have at various times forwarded to you; but as these reports dealt only with the reservation of lands and other subjects then under consideration, I will now briefly describe the geological character of the country traversed by me.

Leaving Gunning (the then terminus of the Great Southern Railway) the road, as far as Yass, passes over tracts of granite, porphyry, and Silurian formations; the latter consisting of sandstones and shales containing quartz reefs, some of which are probably auriferous. The grey granites seen along the road would be very suitable for building purposes; they have a slight pinkish tinge, which imparts an agreeable colour to the stone.

At Yass there is a remarkable development of calcareous sandstones, shales, and coralline limestones, rich in fossils. Some of these fossils have been determined to be of Silurian age, while others are Devonian forms.

For this information science is indebted to the Rev. W. B. Clarke, M.A., F.R.S., F.G.S., who, with his unaided and zealous exertions for the advancement of the scientific knowledge of this country, lately forwarded a large collection of these fossils to Europe for the examination of Professor De Koninck. (See Geological Magazine for August, 1876.)

A fine collection of these fossils, from the Yass beds, has been presented to the Museum of Mines by my friend Mr. John Hume, of Yass. In company with that gentleman, on the 17th April, I examined these richly fossiliferous beds, and also procured some good characteristic specimens, especially of various species of *Favosites* and *Trilobites*, for the Museum. In the cliff-banks on the Yass River, about 2 miles below the town, the beds are splendidly seen in section dipping W. 10–15° S., at angles from 10° to 40°. In the part of the section we examined we saw exposed a thickness of at least 2,000 feet of strata; but the whole formation is of much greater thickness. These beds have been tilted and contorted by porphyritic granite, against which the sandstone beds are altered and much jointed. The porphyry contains double-hexagonal crystals of quartz. I am informed that the Rev. W. B. Clarke has lately made a close examination of this geologically important district. These "Yass Beds" extend to Bowning, intruded, however, by a belt of porphyry half-a-mile wide, which crosses the main road about 2 miles from Yass. After leaving Bowning the road passes for 30 miles over rocky hills composed of porphyry, of various textures and colours, until near Jugiong, where granite appears, which, further on towards Coolac, gives place to serpentine alternating with tracts of Silurian schists. For 3 miles east from Coolac the country is serpentine; then for 7 miles to Gundagai we have Silurian schists. Mount Parnassus, on the southern slope of which Gundagai is situated, is formed partly of greenstone containing veins of asbestos, and partly of Silurian schists, which are in places highly silicious and indurated, and are quarried for flagging purposes. About their junction with the greenstone are several quartz reefs, some of which have been prospected and abandoned, but from their geological associations they deserve attention, and I believe further testing would prove them payable; the alluvial drift in the gullies draining from these reefs has been extensively worked and found very rich. This greenstone is about half-a-mile wide, and then, with the exception of a few narrow dykes of greenstone, the slates continue until within 4 miles from Adelong; thence to that town the country is granite, in which rock, on the north side of the Adelong Creek, are the well-known Victoria Hill quartz reefs; while on the south side of the creek, where the township is now built, the rock is a true greenstone diorite, passing into a hornblendic granite. The richly auriferous character of the worked reefs is doubtless due to the

influence of these hornblendic rocks, for almost wherever throughout the country these rocks occur associated with Silurian beds, there the richest gold deposits have been discovered. I may especially mention as instances the Grenfell, Forbes, Parkes, Burrangong, and Gulgong gold diggings. On the Victoria Hill there are two main lines of reefs—the “Victoria” and the “Old Hill”—running nearly parallel with each other, and about 300 yards apart; they strike N. 10° W.

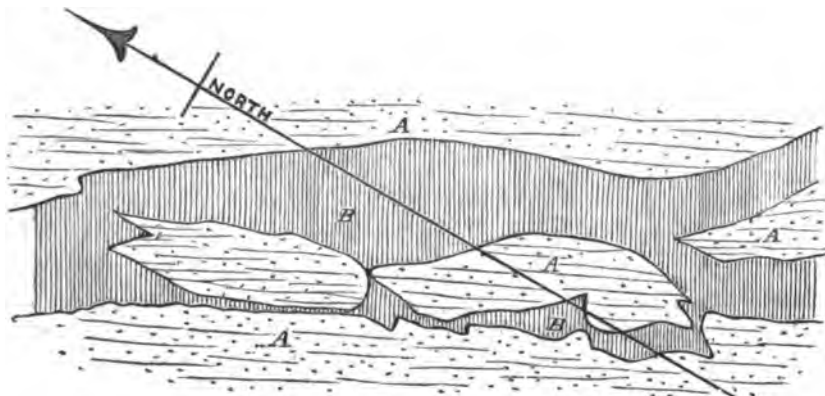
The Victoria Reef has a slight underlay to the east, and the Old Hill Reef dips at an angle of 75° to the west. The reefs or veins of quartz occur in well defined slate channels from 2 to 10 feet wide, and bounded by walls of hard silicious granite, containing black mica. In some of the claims on the former line of reef the yield has been as high as 10 ozs. and 14 ozs. of gold to the ton. Through mismanagement, or some such cause, some of these claims are now idle; yet, with proper expenditure of capital, I feel convinced that they would pay well to work. In the Great Victoria Company's claim the reef has been found gold-bearing at a depth of over 800 feet. The Old Hill line of reef has been worked to a depth of 610 feet in Prowse and Woodward's claim. Then there are the Middle Reef, Currajong, East Currajong, Caledonian, Fletcher's, Donkey Hill, Camp, and Gap Reefs, on which the sinkings are as yet comparatively shallow. As a rule the quartz is highly pyritous, and requires very skilful management in the crushing of it. Having similar indications, there are other reefs, not worked, cropping out in the neighbourhood; some of these are doubtless auriferous.

The Victoria line of reef appears to cross the creek, pass through part of the town, and to crop out on the hill near the Church of England. A shaft has been sunk on this part of it, but not sufficiently deep, in my opinion, to test the reef. I believe that the Adelong Gold Field will become one of the most permanent and important quartz-mining districts in the Colony. At present there are only two crushing-machines employed: one belonging to the Williams Company, the other to Messrs. Wilson & Co., who crush for the public. Both machines are driven by water-power, the water being brought by a race out of the creek a little higher up. That of Wilson & Co. is, I believe, the most complete crushing plant in the Colony. It is fitted with some of the best appliances for saving the gold; and every part is so skilfully and admirably arranged, the whole working together in such perfect order, that it reflects the greatest credit on the manager, Mr. David Wilson, and his co-partner, Mr. Ritchie, who appear to have spared no expense in making their machine most effective for saving gold. One of “Monday's patent” buddles is in use for the final concentration of the pyrites, for the treatment of which a reveratory furnace is now in course of erection.

At my request some statistics were kindly permitted to be copied from the Company's books, giving the number of tons of quartz crushed at this machine, and the amounts of gold collected therefrom by the stamper-boxes, plates, ripples, Chilian mills, and Burdan basins. These statistics are valuable as showing the great advantage of the gold-saving appliances here employed for the treatment of pyritous quartz. The statistics, together with some returns from the Williams Gold Mining Company's quartz-crushing machine, where Denny's patent pulveriser is in use, are given in a tabular form appended to the Report of Mr. W. H. Slee, Inspector of Mines, who has given such a detailed description of the machines as will be instructive to the mining community.

In the bed of the creek, close to Wilson & Co.'s machine, the granite shows lines of bedding (strike, $\approx 30^\circ$ w.), suggesting that they mark the old lines of stratification of sedimentary rocks which have by metamorphic action been transmuted into granite.

This granite is traversed by dykes of greenstone varying from a few inches to 3 feet wide. I took the following sketch of one of these dykes:—



A. White coarse-grained ternary granite, showing lines of lamination; strike, N. $25-30^\circ$ W.
B. Fine-grained greenstone diorite; strike, N. 30° W.

Another similar dyke is traversed by quartz veins from $\frac{1}{4}$ to 2 inches thick (strike, N.W.), which do not pass into the adjacent granite.

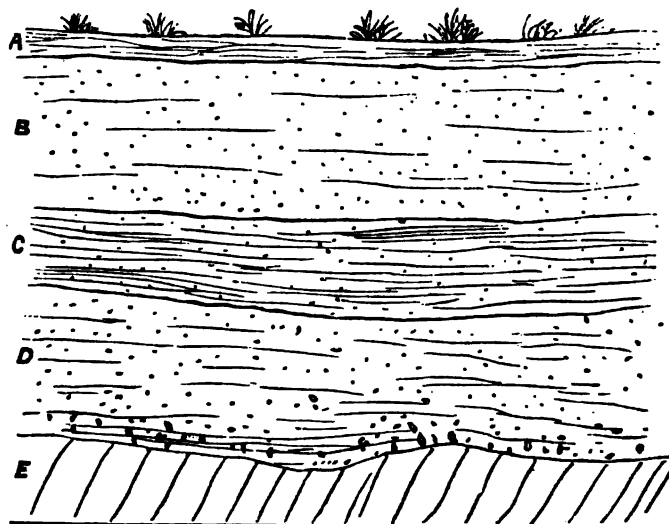
From Adelong the greenstone and granite extend westerly across the Nacka Nacka Creek to the Yaven Yaven Creek.

In accordance with your instructions I examined the country for some miles both above and below the junction of these creeks, and recommended in my report thereon that certain lands on the Nacka Nacka Creek be reserved from conditional purchase, and be proclaimed the Mount Adra Gold Field.

The Nacka Nacka Creek here winds through narrow alluvial flats, from which rocky hills rise on either side to an elevation of 500 feet. Resting on some of the spurs, at from 10 to 70 feet above the creek, are patches of tertiary waterworn quartz-pebble drift, the remnants of the ancient creek bed, which once descended in an unbroken course along the valley, but which has since been cut through during the erosion and deepening of the valley. Consequently the auriferous contents of the denuded portions of the old drift have been, as it were, naturally ground-sluiced and redistributed in the alluvial deposits along the course of the present creek. The latter should therefore be payably auriferous, seeing that the older drift has yielded up to $\frac{1}{4}$ an oz. of gold per load; but the wet sinking, from 20 to 50 feet deep, in the alluvial flats has hitherto baffled the small attempts at prospecting which have been made.

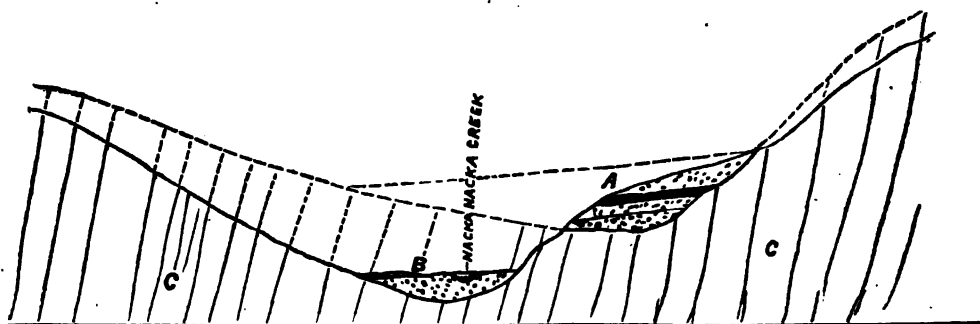
I believe, however, that these drifts would pay to work with the use of efficient machinery, such as that which Mr. R. D. Shepard has so successfully employed in working similar wet deposits at Shepardton, on the Adelong Creek.

In O'Dwyer & Co.'s claim, on the west side of the Nacka Nacka Creek, where ground-slucing has been carried on, the older drift shows in section



- A. 1 ft. chocolate-coloured soil.
- B. 8 „ sub-angular quartz-pebble drift, containing fine gold in payable quantity.
- C. 4 „ stiff white clay and sand, micaceous.
- D. 8 „ fine and coarse rounded quartz drift, ferruginous; yields up to $\frac{1}{4}$ oz. gold per load.
- E. Yellow Silurian shales.

The following sketch section across the valley will show the relative position of the ancient and present auriferous alluvia :—



- A. Older drift (pliocene tertiary).
- B. Newer drift (pleistocene), forming present alluvial flats.
- C. Silurian schists.

The dotted lines show the probable outline of the valley at the period of deposition of the older gravels.

Below the junction of the Yaven Yaven and Nacka Nacka Creeks a narrow belt of granite comes in; thence for 20 miles westwards, as far as Alfredtown, on the Kyamba Creek, the country is of Silurian formation, consisting of sandstones, slates and shales, traversed by numerous quartz reefs. Sections of these rocks are well exposed in the road cuttings on Tarcutta Hill. On the west side of Kyamba Creek, at Alfredtown, there are gold-bearing

reefs on private property. Some years ago several tons of the quartz were crushed, yielding, it is said, 22 dwts. of gold to the ton, but the cost of carriage of the stone to the nearest crushing-machine at Adelong was then too great, and the reef has since been left unworked. Veins of limonite, resulting from the decomposition of iron pyrites, occur in the casing of the quartz reefs, and in this I saw free gold. From near Alfredtown to Wagga Wagga the country is almost entirely granite. On the banks of the Murrumbidgee, near the Church of England at Wagga Wagga, there are masses of grey ternary granite. It encloses angular pieces of quartz and mica schist—a feature common in the granites throughout this district, and one which indicates the intrusive nature of the rock, of which there is further evidence at Oura Station, 14 miles higher up the river, where veins of the granite branch off from the main mass and intrude the adjacent Silurian foliated mica schists. The southern part of the town of Wagga Wagga is on altered micaceous sandy schists. The hills for several miles west from Wagga Wagga are also Silurian, and the high Malebo Range, which forms part of the western boundary of the county of Clarendon, consists of beds of very hard silicious sandstone.

The main road from Wagga Wagga, through Junee, passes for 26 miles over granite formation. Here we have auriferous country; for, near Junee are the Junee Reefs; 20 miles to the north-west are the old Sebastopol diggings; and to the south-east lie the Euronilly Reefs. All these reefs at present remain unworked.

The road now takes a more easterly course, and for about 8 miles we have Silurian rocks, with beds of coarse pebble conglomerate; then granite is again met with, which as we approach Bethungra gradually passes into metamorphic schists, and these altered Silurian rocks extend for some 30 miles, until we get within 3 miles of Wombat, where we enter upon a large tract of auriferous granite country, in about the centre of which the township of Young is situated. I examined a considerable portion of this district, according to your instructions, in reference to the reservation of certain lands, and the result of my examination has already been communicated to you in several special reports.

This locality was, until lately, known as the Lambing Flat Diggings, on which about 15 years ago there was a population of some 20,000 persons chiefly engaged in alluvial mining. Almost every gully likely to contain the precious metal has been pierced with holes and covered with mounds of earth; and every "made" or gravel-formed hill has been cut up by the ground-sluicing operations, laying bare the surface of the solid rock on which the auriferous gravels were deposited. At the present day there are only a few "fossickers," chiefly Chinese, scraping out a living amidst these desolate old workings.

When the ground was originally worked, water was not more plentiful than it now is, while the demand for it was greater; consequently auriferous wash had then to be abandoned, which under more favourable circumstances might be profitably worked. Besides this, the fascinating attractions of new discoveries often induced miners to desert fairly paying ground and seek for richer "finds" at some "new rush." I believe, therefore, that much of this abandoned ground will pay to re-work by ground-sluicing on a large scale, when a good water supply has been provided.

The geological formation of this district is chiefly hornblendic granite, which forms undulating hilly country, with auriferous alluvial deposits in most of the valleys.

In places the rock protrudes in broken masses from the surface; but the hills are generally covered with a rich chocolate-coloured sandy soil, good for agricultural purposes, especially for grain crops.

There can be little doubt that the country about Young, especially that lying in the direction of Murrumburrah, Wombat, and Cootamundry, will become one of the best wheat-growing districts in New South Wales.

In the valleys the alluvial deposits have, as above stated, been almost everywhere prospected and more or less worked for gold. The wash or gravel contains many very rounded quartz-pebbles derived from the Pliocene tertiary drifts. It would appear that the Pliocene drifts once covered a considerable portion of the country, and that in Newer Pliocene times, during the erosion of the valleys by denudation, the older drift was cut through and redistributed, some of it being left on the hill sides, like that forming the surfacing on Victoria Hill, near Young, and the rest going to form those deposits of gravel and alluvium, which vary in thickness from 3 to 70 feet. Bones of the animals that then lived on the earth and witnessed those sweeping changes in its surface are met with in these alluvia. At Tipperary Gully, in the auriferous wash (which has yielded from a few pennyweights up to 1½ ounce of gold to the load, and nuggets weighing up to 8 ozs.), at a depth of 60 feet, a large tooth and some bones were found, probably belonging to the genus *Diprotodon*. Bones of this gigantic marsupial are also found in the gold drifts of the same period at Gulgong diggings.

A section of the "surfacing" or drift-ground sluiced at the Victoria Hill shows:—

ft. in.

- 0 6—Black soil and vegetable matter.
- 1 0—Red ferruginous sandy clay.
- 2 0—Reddish-yellow sandy clay.
- 0 9—Small limonite concretions with sand and gravel.
- 1 9—Yellow sandy clay, with vertical stalactitic pipes of limonite, produced by ferruginous water filtering through from the stratum above.
- 3 0—Loose sandy clay and gravel; the pebbles—some rounded, some angular—disposed in an irregular manner.

Resting on ternary granite.

This granite bed-rock is very micaceous (black mica), and like that near Wagga Wagga it encloses pieces of various rocks, quartz, quartzose sandstone, mica schists, &c.

It is also traversed by veins (strike S. 5° to 10° E.) of white elvan, with thin quartz veins and patches of beautifully figured graphic granite—*pegmatite*. These elvan dykes are from a few inches to 3 feet thick, and contain white silvery mica and nests and veins of crystals of *schorl*—black tourmaline. I was informed that where these dykes were numerous the wash was richer. In Chance Gully, where the alluvial rests on hornblendic granite, traversed by many elvan dykes, it is said to have been very rich. The gold is fine, scaly, shotty, and sometimes in small nuggets, and waterworn. Small angular pieces of quartz,

with gold attached, indicate that the veins of quartz are auriferous; and I believe that the granite itself has also contributed some of the gold. I have collected samples of the granite to be tested.

Quartz reefs are frequent in the granite, and there is every reason to believe that some of them are payably auriferous. One (the Garibaldi Reef) was successfully worked for some time, when, on reaching the water level, it was abandoned.

On 5th May I left Young for Crookwell, near Meringa, 12 miles from Young. I observed some purple and white altered sandstones which are probably Devonian, and may have connection with the coral line limestone 20 miles further south near Mount Bobbara.

From Meringa to Boorowa the country is granite; then several varieties of porphyry and greenstone occur to within 9 miles from Yass, when the Yass beds with their limestones are met with.

From Young to Crookwell I rode along the western watershed of the dividing range, crossing the creeks which form the tributary sources of the Lachlan River. The general formation of this country is Silurian and granite, with occasional patches of auriferous Pliocene Tertiary drift overlaid in places with basalt. Those patches of Tertiary, capped with basalt, occurring at intervals from the Goulburn Road down the valley of the Lachlan River, are the remnants of the ancient river-bed deposited there when the stream flowed at a high-level. Everywhere this older drift is auriferous.

On the Collingwood Estate, and about a mile up the Lachlan River from its junction with the Fish River, occurs an intrusion or pipe of vesicular scoriaceous basalt, which has come through the granite. The basalt contains patches of olivine in abundance, oligoclase felspar, and augite. This is interesting, as being one of the volcanic vents whence issued the lava which flowed into and down the valley, burying beneath its molten mass the ancient river-bed, the only remains of which, as just described, occur as outliers on the sides of the present valley.

The country about Crookwell I have already described in my report thereon, recommending it to be proclaimed a gold field.

I returned to Young, *via* Binalong. At Binalong the formation is porphyry with opaque crystals of white feldspar and glassy quartz in a dark greenstone base, similar to the rocks at Boorowa. At Emu Flat, and near Illalong, we find greenstone and granite with narrow belts of Silurian schists.

I also inspected, according to your instructions, the Cumbamurra and Jugiong Gold Field, and my report thereon you have received.

On the low spurs of the hills on both sides of Spring Creek, from Cumbamurra down to the Jugiong Creek, are patches of Tertiary gravel from 6 to 15 feet thick. This has been extensively worked in places by ground sluicing. The bed of the present stream should be richer than the older drift, seeing that it has had the contents of the latter re-distributed into its own channel. Owing to the wet sinking the ground has not been tried; but this difficulty might be overcome by the use of proper machinery. Higher up the valley of the Jugiong Creek, near Mr. Thomas' farm, and on one of his selections, are patches of magnetic oxide of iron.

stained with green copper ore ; they are 4 feet thick in places, but vary very much in thickness. These occur about the junction of felspar porphyry and granite, in which are some thick quartz reefs striking nearly east and west.

In this gold field is the Marshall M'Mahon Quartz Reef, which was for some time worked, yielding, it is said, as high as 4 ozs. of gold to the ton ; but the reef now lies idle. I believe that it must have been for some reason, other than for the lack of gold in the reef, that work was suspended. The reef at the surface is about 2 feet wide, and contains some chalcidonic quartz and pyrites ; a soft red ferruginous clay dyke, 15 inches wide, forms on one side of it. The reef strikes west 27 degrees north, and dips a little east ; it is in quartzite ternary granite, traversed by a large elvan dyke, having an east and west course.

In several parts of this district I notice other similar reefs cropping out.

At Demondrille, near Murrumburrah, several reefs have been opened and abandoned. The Louisa Reef, which is said to have yielded as much as 3 ozs. of gold per ton, was about 2 feet thick near the surface, but at 70 feet down it became narrow, and so was not further worked.

I am convinced that some of the reefs in this district if worked in an enterprising manner will be proved payable.

From Young I proceeded to Grenfell, passing over Silurian and granite formations with dykes of diorite.

Following down the Burrangong Creek the country is much occupied by Pleistocene alluvium of considerable thickness, so that the boundaries of the underlying formations cannot be accurately determined. I am of opinion that auriferous deep leads exist beneath this alluvial area.

At Grenfell an intrusive mass of porphyrite, about $1\frac{1}{2}$ mile long and from 5 to 25 chains wide, traverses in a northerly course Silurian schists, and at its northern extremity abuts against granite. This dyke is traversed by auriferous quartz reefs, which have been extensively worked.

The adjacent schists also contain many quartz reefs, but none of them, excepting the Evening Star Reef, 7 miles south-east from Grenfell, have been proved payable.

The reefs in the porphyrite have a general north-easterly strike ; they vary in thickness from 1 inch to over 10 feet. The following are the principal reefs upon which a considerable amount of work has been done, some of them having proved very rich :—

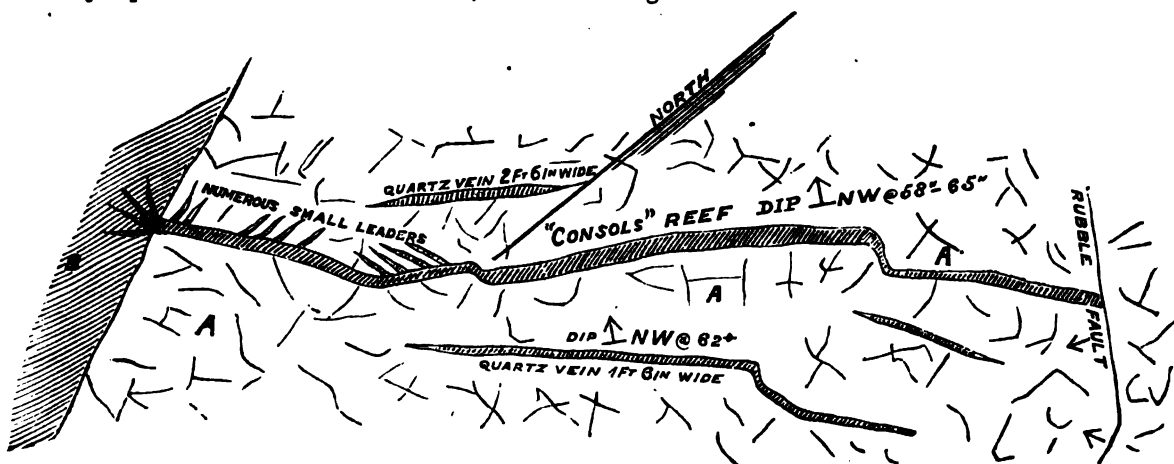
Grenfell Consols or O'Brien's Reef.
 Victory Reef.
 Homeward Bound Reef.
 Frenchman's.
 Enterprise.
 Welcome Home.
 Band of Hope.
 Lawson's.
 Golden Point.
 White Rose.
 Perseverance.
 Prussian.
 Young O'Brien's.
 Oriental.

besides several others. Most of these reefs are now unworked, chiefly owing, it is said, to the mischievous effects of the late mining fever, or through the falling off of the yield of the stone. In the latter case companies have failed through not providing, in time of prosperity, a reserve fund upon which to draw, when in the event of an unfavorable change in the reef some expensive prospecting might for a time be necessary.

I feel assured that when many of the reefs now lying idle have been more thoroughly tested they will show that quartz mining in this district will become a permanent and profitable industry.

The Consols mine is 716 feet deep, following the underlay. Below 500 feet the yield of gold began to fail, but above this to the surface, where the reef was over 10 feet wide, it yielded up to 3 ounces to the ton; the mining manager, Mr. Veal, showed me the stone taken from various depths. At 600 feet the quartz is partly replaced by calcite, of white, green, and brown colors. At about 650 feet the reef changes into a pale greenish feldspathic rock, full of small cubes of iron pyrites and veins of quartz. At 716 feet a break occurs dipping S.E.; the break consists of rubbly schistose rock and calcite, with joints in it lined with pyrites; much water comes in by it, and it is therefore thought to have connection with another vein or fissure not far off, on the south-east side. By cross-cutting in that direction from the 500-foot level a fresh make of reef might be struck. On the surface, about 50 feet from the reef, on the eastern side, a vein of quartz, 18 inches wide and carrying gold, has been opened and found dipping N.W. at 62° . The general dip of the Consols Reef is N. 40° , W. at 56° to 65° ; it traverses a dark colored porphyry containing dark greenish mica. It is worthy of remark that I saw no mica in the rock taken from the lower levels where the reef ceases to contain payable gold. It may perhaps be important to observe if this feature obtain in any of the other quartz mines.

At its southern end the Consols Reef terminates at the junction of the porphyry with the Silurian schists, where it sends off numerous branches into the latter, but these branches soon cease to be auriferous. Some of the Grenfell quartz reefs run in "blocks" which suddenly break off to one side and then continue in the regular course. These "blocks" and "jumps" occur in the Consol's Reef, as the following sketch will illustrate.



A. Dark micaceous porphyry.

B. Upper Silurian schists.

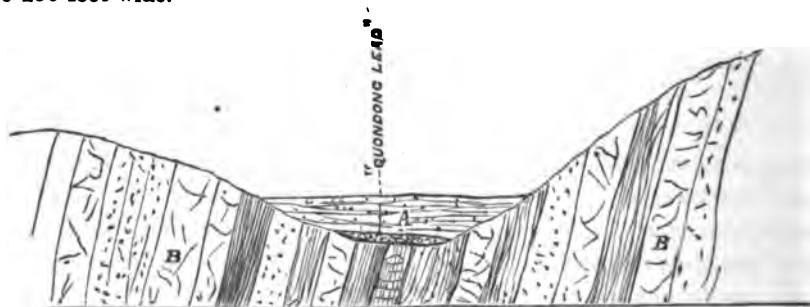
There are three main "deep leads" at Grenfell, the sinking being from 40 to 80 feet, and yield of gold up to 2 ounces per load of wash-dirt. These leads are the beds of ancient creeks which in Newer Pliocene times flowed down the valleys across which the porphyrite dyke extends.

The leads are only payable for about a mile below the dyke, and not payable immediately above it; thus proving that the gold was derived from the denudation of the dyke, or the reefs in it.

These alluvial diggings, now worked out, once gave employment to some 6,000 miners.

Other similar leads, partly worked out, but still occupied by a few miners, occur to the south-east and east of Grenfell; these are the Seven Mile, Chance Gully, Peep of Day, Eureka Flat, Stuart's Gully, Quondong, Milkman's, Slaughter-yard, and Two-mile leads. In the latter, concretions of wood-tin are commonly found, though not in quantity sufficient to pay for saving.

The following is a sketch section across the Quondong Lead, where the sinking is 150 feet down to the auriferous gravel, which averages from 1 foot to 18 inches thick, and from 50 to 150 feet wide.



A Newer Pliocene Tertiary; sand, clay, and gravel, derived from the adjacent upper Silurian. B Shales and sandstones containing quartz reefs.

The country about these leads is chiefly Upper Silurian, though dykes of porphyritic granite like that at Grenfell occur near the Seven-mile Leads, containing also gold-bearing reefs, such as the George Reef, Fontana or Wilson's Reef, &c.

This auriferous tract of country extends in a southerly direction across the Tyagong Creek towards Young; and as from the physical geology of the Tyagong Creek Valley it is certain that a lead runs down it, there can be but little doubt that this lead will be payably auriferous; the sinking however will be deep, as the alluvium in the valley is probably 200 to 300 feet thick.

Grenfell, as regards water supply, is unfortunately situated almost on the top of a range. During the past season of drought the residents of the town had to depend chiefly upon water pumped from two springs. In my report, therefore, upon the reservation of the land about Grenfell, I recommended that the sources of Emu Creek, which are amongst the granite hills leading up to the Warradery Range, should be reserved for water supply. I believe that sufficient water might be collected and stored here in reservoirs to meet the requirements of the town and suburbs, though not for mining purposes.

The Warradery Range, about 2 miles north-west and north of Grenfell, and which forms the source of Emu Creek, is composed of pink ternary granite, which in places contains small patches of amethystine quartz. 1 mile west of Grenfell the formation consists of Upper Silurian altered schists and sandstones nearly vertical; strike, N. 50° E. The Warradery Range here changes its course and runs S.S.W., and for 6 miles is formed of these rocks, and then granite for 2 miles to the foot of the Wedden Range, which rises abruptly in a succession of rocky cliffs to a height of about 900 feet above the surrounding country. The following is an approximate section of the beds forming this conspicuous mountain, taken by my colleague, Mr. A. C. Cruttwell, C.E., F.G.S.

Brown gritty sandstone	16 feet	} In thick beds dipping S. 15°, W. at 38°.
Grey conglomerate silicious base	315 "	
Quartzose sandstone	200 "	
Do. do. and grit...	170 "	
On granite		

The beds form bold cliffs facing to the north; no fossils were found in them. From their lithological character, and their great unconformity to the Upper Silurian schists of the Warradery Range, these Wedden rocks may be of Devonian age, and have once formed part of a great formation to which probably belong those precipitous high hills rising so conspicuously out of the level country which stretches away to the north-west as far as the eye can reach.

After crossing the Warradery Range, 3 miles north of Grenfell, we meet with a broad dyke of diorite in the granite. At the foot of Bald Hill there is granite, but the hill itself, which rises steeply for 540 feet, is partly composed of hard red and white jasperoid rocks, with irregular veins of quartz. North-west from Bald Hill we travelled over undulating Silurian country for 6 miles, and then came upon the level Pleistocene alluvium which forms all that vast tract of level country stretching away to the north and west through the Lachlan district.

I am of opinion that payable auriferous leads will be found in some of the main valleys descending from the Warradery, Wheoga, and Currawang Ranges, and that in their trend northwards they will pass under the Lachlan Plains. At the Pinnacle Range are several quartz reefs, which were partly worked and then abandoned when the rush to Grenfell took place.

8 miles south from Forbes the main road crosses the Braulin Plain. This great plain is one of the finest examples I have seen of those swampy black soil areas, which are frequent on the Pleistocene formation. Their swampy origin favoured, in the drier seasons, a rich growth of grass and other vegetation, which, being afterwards covered with water in wet seasons, decayed and enriched the soil. The decomposition of the vegetable matter induced chemical changes in the subsoil, causing by the generation of carbonic acid gas the formation of marly nodules and the swelling up of the surface into numerous small mounds, the appearance of which, or the discomfort when driving over them, has suggested the names of Bay of Biscay Ground and Dead Men's Graves.

The town of Forbes is situated on low undulating hills of Upper Silurian and granite formation. The former rocks consist chiefly of thin bedded sandstones suitable for building purposes; they dip east 18° south at 42° , and in them I found *encrinite stems*, *favosites*, *petraia*, *cardiola*, and other fossils.

About a mile north-west from the town a deep shaft has been put down, but not bottomed, in Older Pliocene very water-worn drift. This deposit forms a lead 300 to 400 feet deep, which passes about half-a-mile west of the town. This older Tertiary lead has not been tested; but the surrounding formations are favourable for the existence in it of payable auriferous deposits. Between this and the township is the Northern Lead, of Newer Pliocene age, descending from a hill of fine-grained granite, where a considerable amount of surfacing has been done. This granite appears as a dyke running north and south, and it is doubtless the source whence the alluvial leads derived their rich contents. This dyke extends in a northerly direction to and beyond Parkes, changing in places into porphyrite and diorite. It must have influenced the production of the gold furnished to the Tichborne, M'Guiggan's, Wapping Butcher, Bushman's, and other leads in the Parkes Gold Field. In company with Mr. Warden Dalton, P.M., we examined the principal reefs which have been worked near Parkes, and found them traversing diorite and porphyrite, associated with altered jasperoid Silurian rocks. The reefs are nearly all idle, though a considerable amount of work has been done on some of them, the shaft at the Dayspring Reef being 330 feet deep. I had not time at my disposal to make a close inspection of the reefs in this locality, but the geological formations lead to the belief that the reefs should be payable, and that they are far from being worked out. Close to the township of Parkes, and at the bottom of an alluvial lead, at a depth of 80 feet, the Bonnie Dundee Reef, some 25 feet wide, and showing gold freely, had recently been discovered by Mr. Thomas Mitchell. It strikes about north and south, and occurs in a decomposed argillaceous rock, dipping east. The adjacent altered Silurian sandstones contain obscure impressions of fossils.

Excepting a tract of about 5 miles wide of altered Silurian schists and conglomerates, at the head of Rocky Ponds Creek, the country from Parkes to within 18 miles from Wellington is composed of porphyritic granite and diorite formations; thence to Wellington we have a thick series of sandstones, shales, conglomerates, and limestones, traversed in places by greenstone dykes. The limestones contain an abundance of fossils—*Favosites polymorpha*, *favosites gothlandica*, with other corals, *encrinite stems* and molluscs of both Upper Silurian and Lower Devonian forms. These beds I have here provisionally termed Upper Silurian, but they probably belong to the Siluro-Devonian series or Passage Beds, so fully described by the Rev. W. B. Clarke, in his "Remarks on the Sedimentary Formations of New South Wales." Some of the conglomerate beds contain pebbles derived from the diorite which is interbedded with them. The eruption of this trappean rock is therefore contemporaneous with the deposition of these strata. It is sometimes traversed by quartz reefs, which contain gray sulphide and carbonates of copper, though not in payable quantity so far as they have been worked. Samples of these were kindly sent to this department by Mr. W. B. Simpson, licensed surveyor; they were assayed by Professor Liversidge, who reports as follows:—

"No. 25, copper pyrites, Welbang, Wellington; the tarnished variety, known as

Peacock ore, associated with redruthite (the grey sulphide), bornite or purple ore, and green and blue carbonates.

Percentage of metallic copper ... 13.39

No. 26.—Red oxide of copper, from 10 miles north of Wellington. Mixed with the red oxide of copper, is native copper, and associated with them are calcite and ferruginous earthy matter.

Percentage of metallic copper ... 14.26

No. 27.—Mixed sulphides of copper, Kadumbla Range, Wellington; of same character as No. 25.

Metallic copper...	8.98 per cent.
„ silver ...	3 ozs. 18 dwts. 9 grs. per ton.
„ gold ...	traces.

No. 28.—Green carbonate of copper, Three-mile Flat, Wellington; deep green colour, minutely mammillated, associated with a red earthy veinstuff.

Metallic copper...	13.15 per cent.
„ silver ...	8 ozs. 3 dwts. 8 grs. per ton.
„ gold ...	traces.”

Mr. Simpson has contributed specimens of copper ore from nineteen different localities within 25 miles of Wellington, thus showing the cupriferous nature of the rocks. It is probable that when some of the lodes have been properly opened out they will prove payable. In the limestones, 6 miles south from Wellington, are the well-known Bone Caves, from which, on behalf of the Government, the late Professor Thomson and Mr. Krefft, the late Curator of the Australian Museum, obtained a very large collection of fossil remains, which were submitted to Dr. Owen:—

In his official report Mr. Krefft says,—“We obtained many valuable and rare specimens, some quite new to science, consisting of the remains of mammals, birds, and reptiles. The largest bones and teeth (those of the now extinct *Diprotodons* and *Nototheriums*) are of a size equal to those of a full-grown elephant; others do not exceed those of a mouse.” From the very interesting account given by Professor Thomson I quote the following remarks:—

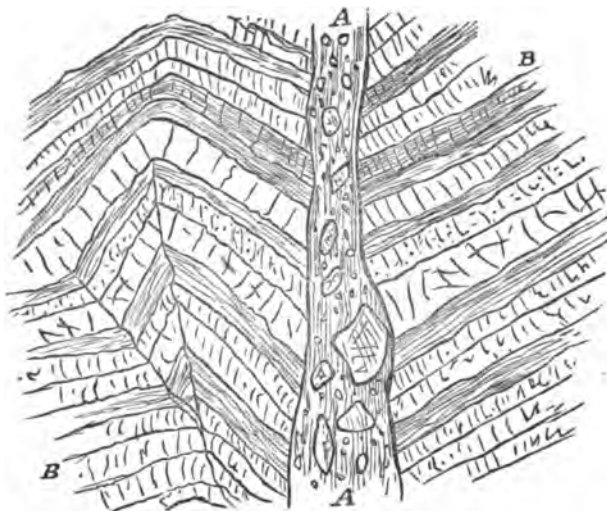
“All the sedimentary rocks of the district have a semi-metamorphic character; the limestone fossils comprise *Stromatopora*, *Receptaculites*, *Favosites*, *Halysites*, *Heliolites*, *Oenites*, *Tentaculites*, *Pentamerus*, *Rhynchonella*, *Orthis*, *Spirifer*, *Atrypa reticularis*, and others; *Strophomena*, *Pterinea*, *Grammysia*, *Loxonema*, *Euomphalus*, *Orthoceras*, *Lituites*. Thus indicating that the series at Wellington forms a part of the wide-spread formation which ranges in a meridional direction through New South Wales, and which is referable either to Upper Silurian or Devonian age.

"The caves at Wellington are about half a mile from the river, and their entrance a hundred feet above it. The principal attraction to visitors is the 'Great Cave,' which has a steep and ragged entrance, leading into a spacious and lofty vaulted chamber, ornamented by one grand stalactite. The floor of the cave is covered to some depth with loose dry red earth. In one spot Sir Thomas Mitchell describes a dry white ashy dust, into which one of his party sank up to the waist; this is still to be found in a corner behind the stalactite. At the same spot the limestone walls show a fine section of their flexuous stratification. Elsewhere in the cave the walls and roof are massive and unbroken, and suggest that the whole structure has been excavated out of the solid rock. * * * The sound and sculptured walls and roof, as well as the arches, pillars, and buttresses of rock which remain, preclude the notion entertained by some observers that the cave is the result of disruption and subsidence, but offer no difficulty to the commonly-received opinion that such structures are caused by the dissolving action of carbonic acid-water, which has the power of gradually wasting away limestone rocks. * * * Though a few fragments of bone have been found in the Great Cave, no discovery of importance has yet been made there. * * * The cave at Wellington, which possesses such great scientific interest, is the 'Breccia Cave.' Its entrance is a few yards west of the Great Cave. It has more the appearance of a pit or well. * * *

A hard red breccia, full of white bones, fills up the spaces as if it were a cement which served to bind the rock masses together. * * *

It has been already stated that the Breccia Cave is now 100 feet or so above the river, and half a mile away from it; but at the time when the bones were accumulating the river probably ran much nearer the cave, and the valley wore a different aspect. The caves may have served as slight drainage channels for the rain which fell within a short space around, like many similar hollows in limestone rocks; rain-water now washes into some parts of the caves. A cave situated near the bank of a river which is liable to sudden floods would not be an unlikely spot to receive such an accumulation of bones as we now find. Animals which had taken refuge in it may have been hemmed in by the water, and drowned; at times, too, it may have served as a den for the carnivorous *Thylacines*, whose remains are mingled in abundance with those of extinct wombats and kangaroos—the herbivorous forms on which they preyed. Several bones have been found which showed distinct marks of having been gnawed by a carnivorous animal. Fissures and openings, such as are common in limestone rocks, often serve as pitfalls for the larger animals, but would have proved no source of danger to the smaller creatures whose remains occur here in such abundance. The breccia in its present condition does not afford any clue to the original cause of the accumulation. One supposition which may be mentioned is that the animals were poisoned by carbonic acid, or some other deleterious gases issuing from the ground."

The limestones are much contorted and fissured. This is well seen in the wall of the Great Cave, where I took the following sketch:—

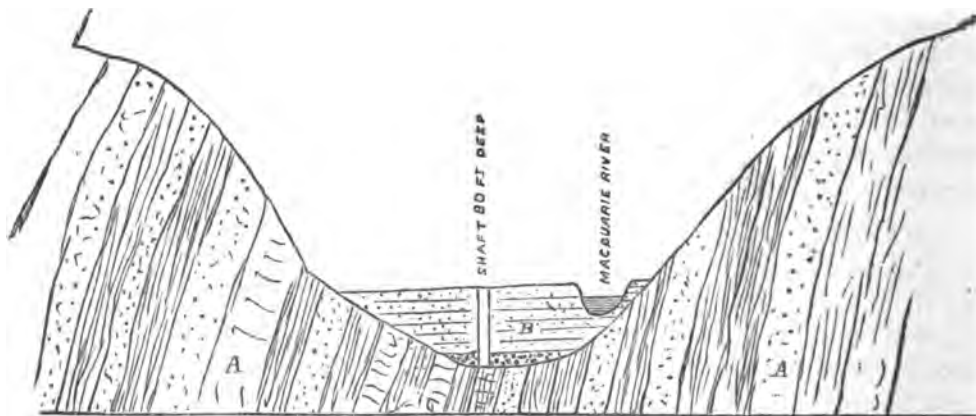


A Fissure, 4 feet wide, filled with coarse angular and rounded boulders of limestone and red earth.
 B Thin-bedded hard limestone; thickness seen, 15 feet.

From Wellington I proceeded to Burrandong, and examined part of the Macquarie River Gold Field, in the vicinity of Katella, the estate of Mr. F. B. Suttor, M.P. The geological formation of this part of the Macquarie River valley consists of diorite and Silurian schists, conglomerates, and sandstones, with quartz reefs. In places there are outliers of Tertiary pebble drift capping some of the spurs, betokening the former extent of the ancient alluvial deposit which partly filled this valley, and which has been so extensively denuded; the coarse *débris* having gone to form those terrace-like banks of gravel through which the present stream has its winding course; while the lighter sand and mud were swept further along by the ancient flood waters, and deposited over that low-lying country which forms the wide-spread alluvial plains of the interior.

Above where Oakey Creek joins with the Macquarie River the valley narrows between steep rocky ranges, which rise on either side to a height of from 300 to 800 feet, and the river winds in a tortuous manner through alluvial flats, which are not more than 20 chains across in their greatest width.

These river flats consist of deposits of gravel and sand attaining a thickness of 80 feet. A sketch section across the valley at Tweedy's Flat shows thus :—



A. Silurian schists and sandstone. B. Pleistocene Tertiary drift-sand and gravel.

This pleistocene drift is thus seen to have filled up the old river channel, and the channel of the present river has only been cut into it to a depth of about 50 feet. In places the drift has been worked and proved payably auriferous, but in others the great influx of water at the bottom baffles the ordinary manual appliances. With proper machinery I believe that the old river-bed would pay well for working. At the junction of the Muckerawa Creek with the river the upper part of this deposit is ground-sluciced to a depth of about 20 feet (the greatest depth to which a tail-race can be brought up to the drift from the level of the present river), gold being found distributed throughout it.

As this old river channel will be extensively worked at some future day I have recommended that the flat for 15 chains on each side of the river, and for a distance of 10 miles along it, be reserved for future mining purposes.

No miners were at work here at the time of my visit, so that I had not an opportunity of examining the washings for diamonds and other precious stones. The Pliocene Tertiary formation which caps some of the ranges is favourable for the occurrence of the diamond, and as this formation has been largely denuded in this valley, there is no doubt but that many diamonds will yet be discovered in the river-drift. I am reliably informed that diamonds have been obtained from the wash-dirt at Suttor's Bar, near the Katella station, and also at the mouth of the Muckerawa Creek. The minerals which have been found by the late Professor Thomson and Mr. Norman Taylor, in similar deposits at the Two-mile Flat, on the Cudgegong River, and which are likely to occur here, are: 1, *black vesicular pleonast*; 2, *topaz*; 3, *quartz*; 4, *corundum*, including (a) *sapphire*, (b) *adamantine spar*, (c) *Barklyite*, (d) *a bluish white variety, characteristic of Mudjee*; (e) *ruby*, and (f) *rolled corundum, dirty white and pink*; 5, *zircon*; 6, *tourmaline*; 7, *black titaniferous sand*; 8, *black magnetic ironsand*; 9, *brookite*; 10, *wood-tin*; 11, *garnets*; 12, *gold*; 13, *the diamond*.

In my report on this gold-field I have also directed your attention to the necessity of reserving from alienation the tract of country lying immediately east of the confluence of the Cudgegong and Macquarie Rivers.

In the parts known as Spring Creek, Potatoe Ground, and Devil's Hole, there have been some extensive shallow alluvial diggings, now nearly worked out, which are reported to have been very rich and to have yielded some large nuggets of gold. On examining the country I observed the geological formation to be Silurian, with intrusive masses of greenstone or diorite, traversed by quartz reefs. I consider this locality to offer very favourable indications of the existence of auriferous reefs. Many of the alluvial workings extend up to where quartz reefs crop out at the surface, from the denuded portions of which the gold in the alluvium has most probably been derived.

On all our principal gold-fields it has been noticed that the reefs traversing the rocks—Silurian associated with diorites—which are here presented, appear to be the chief original matrix of the gold. I am of opinion that to some extent the gold has been derived from the diorite itself, which is often much impregnated with iron pyrites. I have collected numerous samples of the diorites for assay, with the view of ascertaining whether this rock may not contain gold in sufficient quantity to be profitably extracted.

From Wellington to Mitchell's Creek, a distance of 10 miles, the country consists chiefly of greenstone with short intervals of Silurian schist and limestone.

Finding the geological formation about Mitchell's Creek to be of a very promising character, as regards the occurrence of auriferous quartz reefs, I communicated the fact to you, and, in accordance with my recommendation, a considerable area has been withheld from free selection and reserved for mining purposes.

The Mitchell's Creek Company's Reef occurs in diorite. It is from 2 to 4 feet wide, and dips E. 30°, N. at 40°. A crushing of 440 tons from here yielded at the rate of $\frac{1}{4}$ oz. of gold per ton. The quartz also contains sulphide of copper, iron, and lead, and green and blue carbonates of copper.

Several other reefs crop out in the vicinity. About 3 miles further to the north is the Kaiser Gold Mine, belonging to Messrs. Rouse and Jamieson.

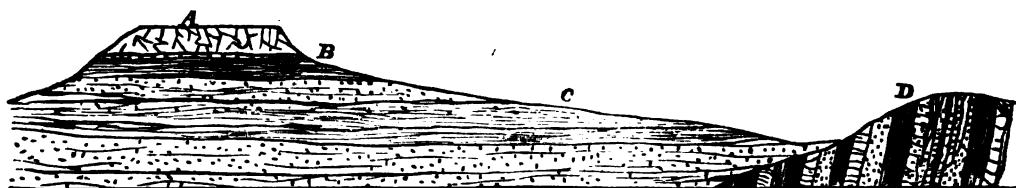
There are several reefs here, the quartz being sometimes of a very honey-combed or spongy nature and charged with pyrites. Associated with these are irregular lodes and masses of slaty greenstone hardly distinguishable from the encasing rock. The fissures in this vein stuff are often filled with per-oxide of iron and carbonates of copper, in which occur coarse specks of gold. Some good specimens, showing this remarkable association of gold with copper ore, were kindly presented to the Museum of Mines by Messrs. Rouse and Jamieson.

It is highly probable that patches of the greenstone itself will be found sufficiently auriferous to pay for working, for I think there can be no doubt that the gold has been concentrated in the veins and lodes by the chemical action of meteoric water infiltrating from the greenstone.

From Mitchell's Creek, from 1 mile along the road to Gulgong, we pass over Silurian schists with dykes of diorite, and suddenly come upon coarse-grained porphyritic granite enclosing large rectangular crystals of orthoclase felspar.

This granite which is probably tin-bearing, extends to the head of Spicer's Creek, near the Springs; then for a short distance altered Silurian shales and greenstones occur in places overlaid by coal measures. At Gardner's Hill the coal measures are capped with basalt; near here a gully, which in its downward course passes from the Coal Measures on to the Silurian rocks, has been worked for gold. This would seem to suggest that the gold has been chiefly derived from lower conglomerate beds of the Coal Measures, where they rest on the schists, and in such case it is very likely that those conglomerate beds themselves, or portions of them, may be payably auriferous.

The accompanying sketch shows the relative position of these beds.



- A Gardner's Hill—basalt 50 feet.
- B Thin layer of Tertiary Pliocene drift.
- C Coal Measures—shales and conglomerates. The gold workings are near the junction of the conglomerates and Silurian.
- D Silurian sandstones and shales with quartz reefs.

From there to Gulgong the country is more or less auriferous, the formations consisting of greenstone, Silurian schists, Coal Measures, Older Pliocene, and Newer Pliocene Tertiary gravels.

The District of Gulgong is one of special geological interest, and when we remember that it has produced over 16 tons of gold within the past seven years its economic importance entitles it to rank as one of the leading gold fields of New South Wales; nor is its mineral wealth alone that upon which it will have to depend; the immediate surrounding district embraces some of the finest pastoral and agricultural lands in the colony. Much of this land has hitherto been reserved as a restricted gold field, and consequently agriculturists have been deterred from settling upon it; but while the result of my recent examination of this gold field has shown the necessity for the reservation of certain portions of it for future mining purposes, it has also enabled me to recommend an area of upwards of 24,000 acres, embracing some of the best agricultural areas, to be thrown open for conditional purchase under the 14th section of the "Crown Lands Alienation Act, 1861."

In this Progress Report I will only allude to the prominent geological features of the district, deferring a more detailed description for the special report to accompany my geological map which is in course of preparation.

The town of Gulgong is situated almost on the northern end of the main range, which forms the watershed between Cooyal Creek on the east, and the Cudgegong River on the west.

This range is composed of granites and Upper Silurian conglomerates, schists, and limestones, intruded by large masses and dykes of greenstone diorite. It is to the influence of these

igneous rocks that the production of the gold-bearing quartz reefs which traverse this range is due. On either side the range is furrowed by gullies and creeks, along the beds of which are the so-called "leads," which gradually deepen, or rather, the alluvium deposit which covers them becomes thicker, as they descend into the main valleys. These leads have yielded almost the whole of the gold produced in the district. The depths to which the miners have had to sink for the noble metal have been from a few feet, where the working is called "surfacing," to about 200 feet.

These leads are the beds of ancient watercourses, whose streams drained off for ages and ages the rain water which furrowed and scooped out the sides of the range into valleys. During the process of denudation reefs were broken up, and their auriferous contents washed down and lodged in the channels of the old streams. The richness of the leads is therefore often an indication of the proximity of reefs whence the gold was originally derived; and conversely the nature of the rocks forming the hills is indicative whether or not the alluvial deposits in the intervening valleys are likely to be auriferous; hence the importance of a geological examination in determining the areas required to be reserved for mining operations.

The first leads discovered were Adam's Lead and the Black Lead, which take their rise from the Red Hill, on the northern side of which the township of Gulgong is situated.

Adam's Lead takes a westerly course towards the Moonlight Lead; and the Black Lead, which in about a mile from its source is joined by the Happy Valley Lead coming from the south-east, trends northerly into the valley of Reedy or Cooyal Creek, and is overlaid by a thick covering of Pleistocene clays and gravels and basalt.

Both the "Black" and the "Happy Valley" Leads proved exceedingly rich in places till about a quarter of a mile below their junction, when the wash dirt becoming somewhat poorer, and the sinking deeper—160 to 180 feet—with a heavy influx of water, the ground could not be profitably worked by the ordinary manual efforts of the miners, unaided by steam machinery, and the mining operations consequently stopped here.

However, about a mile further to the north on the same lead, a shaft was sunk 175 feet deep, and an 18-horse power engine employed for pumping.

The shaft passed through—

40 feet sand loam and clay.

130 feet vesicular basalt, having some large open crevices.

5 feet light pebble drift and wash, cemented in places with oxide of iron and iron pyrites, and containing fragments of fossil wood and pieces of kerosene shale, bottomed on indurated schist. The wash is said to have yielded 5 dwts. of gold to the load.

West from the shaft 80 feet, the bed rock dipped a little, when a gutter or run of wash-dirt, 30 feet wide, gave in places $\frac{1}{2}$ to 1 oz. of gold per load. Toward the east and south the ground was found to rise, but dipping towards the north, and in this direction, at the end of a drive 300 feet long, which passed through a bar of porphyritic granite with pink felspar, a monkey shaft was sunk 20 feet in rounded pebble drift containing gold, and the bottom found

still dipping. Here the workings were stopped, and the mine has since remained idle. From the fact that pieces of kerosene shale were found in the wash it would appear that the drift had come from an easterly direction where the Coal Measures are seen in the hills, and that the shaft did not strike the continuation of the Black Lead, which, I think, will be found to run in deeper ground between the shaft and the gravel ridge which rises from the flat half-a-mile to the west; but this can best be proved by a boring in that direction.

It is of great importance to the district that this deep ground should be tested; for if found payable, as I believe it will be, there is an extent of such ground along the course of Cooyal Creek practically inexhaustible. This part of the valley forms the only outlet for the continuation of the deep leads from the Home Rule diggings, as well as of the Black and Star Leads from Gulgong.

As showing the auriferous character of the wash-dirt in one of the rich claims, No. 7, four-men's ground, on the Happy Valley Lead, I subjoin the following returns, kindly obtained for me by Mr. H. Farr:—

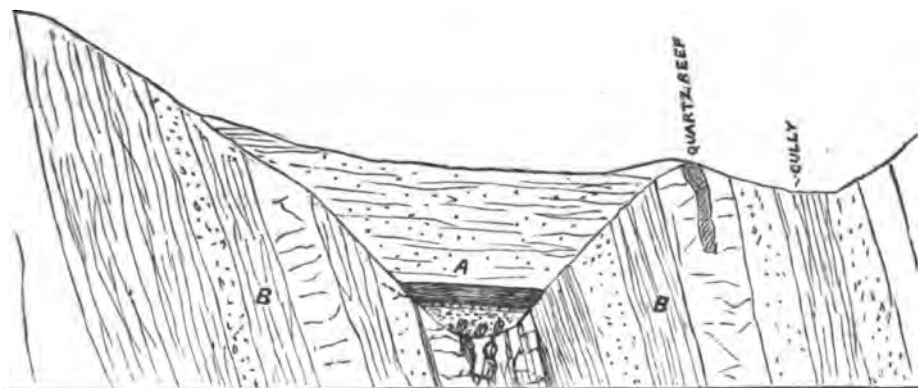
Loads of wash-dirt.	Yield.
85	939 ozs.
272	1,550 "
340	1,344 "
404	908 "
445	1,467 "
<hr/> 1,546	<hr/> 6,208 "

The average yield of which is 4 ozs. 5 grains per load. No. 5 claim on the same lead was even richer. Of two of the largest nuggets of gold found one weighed nearly 90 ozs., the other 60 ozs.

About half-a-mile higher up the lead in Homer's paddock the bed rock was found to consist of crystalline limestone in which several large fissures and caverns were met with, some open, others filled with pebble drift. The foul air issuing thence sometimes extinguished the candles.

The drift was followed down for 30 feet and found to contain gold all through it, averaging $1\frac{1}{2}$ to 2 dwts. per load, but this yield would not pay working expenses. The "headings" or waste dirt was thrown down into the open caverns.

The following is a sketch section across the lead at this point:—



A. Happy Valley Lead.

B. Upper Silurian schists with beds of crystalline limestone in which are deep cavernous fissures.

The depth of sinking was 174 feet, passing through—

Clay and gravel, with cement.....	120 feet.
Black clay.....	12 „
Clay and gravel	10 „
Coarse quartz pebble wash, yielding 9 dwts. per load ..	1 foot 6 inches.
Quartz pebble drift and fine micaceous clay, mingled with limestone boulders. These boulders are often coated with black oxide of manganese and brown oxide of iron	30 feet.

The Canadian diggings, situated $4\frac{1}{4}$ miles south-east from Gulgong, have also been very rich. Here we find several leads descending from the eastern side of the main range above mentioned. In a short distance they unite, and form the Canadian Lead, which runs in a north-easterly direction through Mr. Chas. B. Lowe's paddock, to Home Rule, where it joins with several other leads which have been extensively worked until the sinking proved too deep and wet, and consequently further exploration without the aid of steam machinery became almost impossible.

The Canadian Lead, especially in Lowe's paddock, proved very rich, as the following particulars will show, for which I am indebted to Mr. Lowe, of Goree.

The length of the lead through the paddock was 4,660 feet, and the width of it that proved payable was from 300 to 500 feet. The sinking averaged about 65 feet deep. The wash-dirt ranged from 1 to 4 feet thick.

From No. 1 claim seven men in three years obtained, clear of all expenses, gold to the value of £28,000.

In No. 20 claim the result of the labour of six men during two years, realized, after paying expenses, £16,000.

And in No. 15 claim Mr. Herbert Lowe informed me that he saw as much as 35 ozs. of gold washed from one tin-dishful of dirt. But the average yield of 400 loads from this claim was 3 ozs. per load.

Mr. J. Deitz, of the Canadian Lead, has kindly sent me the following particulars of recent washings from the "Prospector's Claim" at the Canadian Lead. Number of loads washed—23,785, which yielded 6,007 ozs. 11 dwts. 20 grains of gold; also, from the No. 2

claim, in Clarke's paddock, 5,044 loads yielded 1,842 ozs. 15 dwts. 9 grains. It thus appears that the average yield per load from this part of the lead is rather low; but this is in a measure compensated for by the great thickness of the wash-dirt, which in the "Prospector's Claim" ranged from only a few inches in some places to over 60 feet in others, varying according to the uneven limestone bottom, which, like that in the claim above-mentioned on the Happy Valley Lead, is broken by cavernous fissures filled with auriferous gravel.

In the same claim, at a depth of 140 feet, Messrs. Gazzetta and party, last November, unearthed a nugget of gold weighing 6½ ozs. 3 dwts. This fine nugget (of which I took a model for the Museum) was almost entirely coated with per-oxide of iron, which nearly prevented it from being detected as gold.

I have given the above few particulars respecting the yield from the Upper Tertiary leads to show that rich gold-bearing reefs must have been denuded and broken up during the erosion of the valleys. As it is highly improbable that only the upper or denuded portions of the reefs contained such rich stores of gold, we may with much certainty expect that the remaining portions of the reefs will be equally rich. Search should therefore be made for these reefs in the vicinity of the leads; for I do not regard it as a visionary belief that reefs will here be discovered and profitably worked for years after alluvial mining has ceased to engage attention.

The future prospects of the mining industry in the Gulgong Gold Field may therefore be considered as very encouraging, though the development of its mineral resources will necessarily not be rapid.

On the western watershed of the main range no less than six different leads have been worked, and their courses traced into the 4,000-acre paddock of Guntawang—the estate of Mr. R. Rouse, M.P. These ancient watercourses converged almost in the centre of this paddock, and then form one channel. The general direction it has taken may be determined by the basalt rock which extends into the valley of the Cudgegong River, and then follows the course of the river. The leads in the Guntawang Paddock have not been traced down to where they become united, the several attempts to do so having been unsuccessful; however, there can be but little doubt that rich deposits exist in the deep channel beneath the basalt, to work which will require powerful machinery for pumping.

There are several other similar leads which I will not here describe as they will be shown on my geological map of the Gulgong District.

The Red Hill at Gulgong consists of altered Silurian rocks, intruded and greatly disturbed by dykes and masses of diorite. These rocks are confusedly intermixed with each other; they are traversed in all direction by numerous quartz-veins of irregular thickness. The surfacing, composed of the debris from these reefs, has in places been profitably worked; and even now, after the soil has been washed by rains, the children playing about the ground occasionally pick up small pieces of gold.

These facts show that some of the reefs must be auriferous, but though several of them have been prospected no permanently payable results have been obtained. One shaft was sunk in hard altered rock to a depth of 174 feet without success; and in another place at no

great depth from the surface over 60 ozs. of gold are said to have been got from one bucketful of stone, but there was no continuation of this stone. However, I cannot but believe that rich veins exist on the western slope of the hill, and also on the northern side of it, near the main road, where the diorite and schist are pretty clearly defined. The Parramatta Reef, $\frac{1}{2}$ a mile north of Gulgong, was worked to a depth of 185 feet by Messrs. Jamieson and party, but the average yield was hardly sufficient to pay the expenses of raising and carting a distance of 2 miles to be crushed, so the works were suspended. On the old Gulgong Reefs, 3 miles south-east from the township, a considerable amount of work has been done, but they are now idle; the quartz is said to have yielded up to 3 ozs. of gold per ton, but it became poorer with the depth; it contains sulphides of copper, lead, zinc, and iron, the latter occurring in cubes and pentagonal dodecahedrons.

These reefs, of which there are three, deserve, in my opinion, further attention, seeing that the rock in which they occur—hornblendic granite—favours the belief that they may prove payable.

A reef has been worked for some time with encouraging results at the Three-mile Lead by Mallison and party, who are now erecting a crushing-machine near the mine.

The introduction here of this machine will afford facilities for testing some of the many untried and promising looking reefs which occur throughout the ranges in this locality, and which must have fed the Three-mile, Magpie, and other leads that run into the Guntawang paddocks.

From the Old Gulgong Reefs a high range extends westerly for 7 miles to Mount Galambine, near Gooree, the estate of Mr. C. B. Lowe. This range consists of altered Silurian schists and conglomerates, with intrusive masses of diorite and porphyry. Numerous quartz reefs are seen cropping out on the surface; that some of them are auriferous is evident from the fact that in several of the gullies draining from them, payable gold has been obtained. The Digger's Gully, which runs through the Goree Paddocks, has been worked for some time.

Near the main Road, between Mudgee and Home Rule, there is a mass of greenstone traversed by quartz veins. The detritus from this greenstone is almost everywhere gold-bearing, and several rich patches have been worked in the shallow gullies. The rich Log Paddock Lead has also derived its golden wash from this source. A few miles further east are the Newcastle and Pipe-clay Diggings on the Havilah estate. Here also the gold has evidently come from reefs associated with a dyke of porphyritic greenstone, which has intruded the Upper Silurian beds.

On Lawson's Creek, about $1\frac{1}{2}$ mile below the residence of Mr. N. P. Bayly, coarse nuggetty gold was found near the junction of the granite and Silurian. A short distance lower down the creek, some beds of variously coloured encrinital marble limestone crop out. Similar crystalline limestone is seen again to the north, near the Pipe-clay Creek. At Gulgong also it occurs in beds of irregular thickness; it will here be valuable for the manufacture of lime for local building requirements.

There is a considerable tract of basalt in the Gulgong district. At the period when the deep leads, such as the Black, Moonlight, Caledonian, &c., formed the drainage channels of the country, and when the banks of those ancient streams were covered with luxuriant vegetation,

amidst which the gigantic *Diprotodon* and other (now extinct) animals found genial pastures, an outflow of lava from some point of eruption came flowing down from a northerly direction, and entered the Cooyal Valley, just above where the Slapdash Creek junctions with the Cooyal Creek. It then flowed in a westerly course round the Gulgong Range, and up the side valleys, covering up the leads as far as the level of the ground would admit it, and passing through a narrow gap between two hills, near the Caledonian Lead, it streamed into the Cudgegong Valley, and formed as it were a natural dam across it, just above where the Guntawang Woolshed now stands.

Some of the molten basalt spread up the valley for about a mile, while the rest flowed down it in a semi-fluid mass, about 150 feet thick, partly filling the valley for some 20 miles further on. The subsequent denudation and deepening of the valley has swept away much of this old basalt flow, leaving remnants of it as outliers, which are well seen on the sides of the Cudgegong Valley, at the Two-mile Flat Diggings. Here the miners tunnel under the basalt to get at the old river gravel which yields both gold and diamonds. The geology of this locality and of the Diamond Mines, at the junction of Reedy Creek and the Cudgegong River, has been so faithfully described in the published joint report of the late Professor Thomson and Mr. Norman Taylor, geological surveyor, that it is unnecessary for me in this report to describe it again.

In most of the leads vegetable fossils, trunks of trees, leaves, nuts, ferns, &c., are found. In the auriferous gravel in Black Lead, beneath the basalt, at a depth of 160 feet, and also at Home Rule, at 130 feet, these fossils are very abundant. I have obtained a large collection of them for the Museum of Mines.

I submitted characteristic specimens of all the species to Baron Ferd Von Müller, C.M.G., M. & Ph. D., F.R.S., who kindly undertook to examine them. The result of his examination is, that amongst them, in addition to several species previously described, he has determined no less than *nine* species and *seven* genera new to science. The Baron has forwarded me his description and diagnosis of these new fossils; they will accompany this Report. For this very valuable contribution to the scientific elucidation of the geology of the Tertiary epoch we are greatly indebted to that distinguished botanist.

In the Magpie Lead, at a depth of 40 feet, I found numerous fragments of bones. Amongst them Mr. E. Pierson Ramsay, F.L.S., Curator of the Australian Museum, has identified a portion of tooth of *Diprotodon*; pieces of the left lower ramus, leg-bone, pelvis, toe-bone, and shoulder-bone of *Halmaturus*; also an incisor of a large *Macropus* and foot-bone of *Macropus*.

In the Home Rule Lead, at a depth of 126 feet, a fossil *Unio* was found associated with the vegetable fossils. The discovery is interesting, inasmuch as this is the first fossil shell of the kind yet found in the Pliocene Tertiary gold drifts.

The Upper Coal Measures occupy a considerable area to the east and north of Gulgong. At the head of Cooyal Creek they are overlaid by thick beds of the Hawkesbury sandstones, which form bold, rocky, escarpments around the valley, presenting precisely similar physical features to those seen in the Blue Mountains, near Mount Victoria. The Hawkesbury sandstones here form the crest of the Great Dividing Range. In the underlying coal measures a seam of kerosene shale occurs, and it is probable that coal seams exist also. I obtained some fine specimens of *Glossopteris*, with *vertebraria*, *coniferous seeds*, &c. On the northern side of

Cooyal Creek the Coal Measures rest in some places on the upturned edges of the Upper Silurian schists, in others on granite. In the gullies running over the schists and granites the alluvium has been worked for gold, and it is very probable that the lowest beds of the Coal Measures here also contained gold in payable quantity.

On the Cooyal Estate—Mr. S. Blackman's—an auriferous lead has been worked for some time; it runs through granite country, and contains tin ore in quantity almost sufficient to pay for collecting. This granite contains masses of cream-white orthoclase felspar, in cauliflower-like bunches, through which are scattered crystals of smoky quartz. Some of these crystals are nearly a foot in diameter.

Between Cooyal and Warrabil Springs there is a thick lode of iron ore. The ore consists of a very pure brown hæmatite, with some magnetite.

The Coal Measures are seen again at the junction of Reedy Creek with the Cudgegong River; they extend into the Guntawang paddocks, and then in a narrow belt as far as Beau Desert, where, in a well sunk near Mr. George Rouse's residence, the shales show markings of coal.

North of Gulgong, at Tallawang, the Coal Measures cover a large extent of country; their lowest beds have here been found to be payably auriferous. I reported this interesting discovery to you in November last, stating that during my examination of the Tallawang Gold-field Reserve I observed the important fact that the gold found in the Tertiary alluvial deposits at the Old Tallawang and Clough's Gully diggings has chiefly been derived from conglomerates in the Coal Measures. These conglomerates are associated with beds of sandstone and shale, containing *glossopteris*, the fossil plant characteristic of our Coal Measures. At Clough's Gully the conglomerate is being worked *in situ*, and yields from 1 to 15 dwts. of gold per ton, while nuggets weighing 5 ozs. have been obtained from it. Several hundreds of tons of the conglomerate (locally termed cement) have been crushed, but as the yield is said to have been patchy or variable, work has been stopped, and the ground is now held under lease. There are, however, a few miners still at work in the adjacent claims, and I took the opportunity of purchasing from one of them a sample weighing 1 oz., of the gold which he was crushing by hand out of hard cement. The gold is coarse in size, remarkably scaly, and water-worn. I hope to secure for the Museum of Mines some samples of the conglomerate containing gold. Mr. R. M'Kay, of Clough's Gully, gave me one small piece showing coarse gold.

This is the first time that gold has been noticed as occurring in *payable quantity* in the Coal Measures of this Colony, and it is not unworthy of remark that we here possess one of the most ancient auriferous alluvial deposits in the world!

It affords me much pleasure in thus adding the above testimony to the researches of the Rev. W. B. Clarke, M.A., F.R.S., who many years ago ascertained the occurrence of gold in minute quantity in the Hawkesbury rocks at North Shore, Sydney, at Govett's Leap, and in the conglomerates of the Coal Measures in the Southern District, in which latter formation the late Sir Thomas Mitchell also found a speck of gold in a pebble of quartz, and he communicated his interesting discovery in a letter to the Rev. W. B. Clarke, in the year 1855. (See "Southern Gold-fields" and "Discovery of Gold in Australia.") Gold is also stated to

occur in the Coal Measures at Peak Downs, in Queensland, near Hobart Town, in Tasmania, and in New Zealand. But apart from the scientific interest attaching to the subject of the geological age of auriferous alluvia, the fact that gold in payable quantity has been proved to exist in the Coal Measures is one of considerable importance, for it may lead not only to the working of some of the conglomerate beds at the Old Tallawang Diggings but also to the discovery of other similar auriferous patches which no doubt occur in the Tallawang Gold-field and in other parts of the Colony where the same geological features are presented. And I believe that most of the gold obtained from the leads of the Diamond Mines, near the confluence of the Reedy Creek and the Cudgegong River, has been derived from the conglomerate beds of the Coal Measures which there rest on altered Silurian schists. These conglomerates have not yet been tested; they deserve the attention of prospectors, for if found to contain payable gold deposits, as I believe they do, then the same may be expected from the continuation of these beds at Guntawang and at Beau Desert. At the latter place the Coal Measures lie in a narrow but deep depression in the Silurian formation, which on the western side of the river is traversed by diorite and quartz reefs.

From the foregoing it will be seen that the Gulgong Gold Field is one of special interest both in a scientific and economic point of view. I have made a valuable collection of rocks, minerals, and fossils, illustrative of its geology, which will be very instructive. That 16 tons of gold have been obtained within six years is evidence of the rich character of the gold-bearing formations. It has been shown that the richest auriferous deposits occur where the Upper Silurian rocks have been intruded by diorite or hornblendic granites, and that it is to the disintegration and denudation of these rocks that the alluvial leads owe their rich contents. These payable alluvial deposits are of four periods:—Pliocene, Upper Pliocene, Pleistocene, and Recent—and now we can add another, the Carboniferous, the oldest formation as yet discovered, containing drifted or waterworn gold.

Iron ore and limestone, and probably coal with kerosene shale, exist in considerable quantities. Diamonds have been proved to occur in such numbers as to lead to the belief that the search for them will be remunerative at some future time. A copper lode has been found at Belara, but the mine is now idle; however, it is believed that further prospecting may prove this to be a payable lode.

Like Grenfell and Parkes, Gulgong is unfavourably situated for its water supply. The nearest point of the Cooyal Creek is more than 2 miles distant from the town, and that of the Cudgegong River $3\frac{1}{2}$ miles; the former being about 160 feet below the town, and the latter 220 feet. The township is now chiefly supplied with water brought in carts, a distance of $1\frac{1}{2}$ mile from a deep shaft called the "Wait-a-while," which affords a never-failing supply. It has been proposed by Mr. Warden T. A. Browne, P.M., Mr. T. Bolton, District Surveyor, and Mr. Nardin, Road Engineer, that the town should be supplied with water from this or some neighbouring shaft by pumping into a reservoir constructed on the Church Hill, whence it might be distributed throughout the township. This would, in my opinion, also be the most advantageous scheme to adopt to meet the present urgent domestic necessities of the residents of Gulgong. But having regard to a gravitation scheme and to the future requirements of the town and district when the population shall have increased, I am of opinion that we must seek the source of supply in the Cooyal Creek Valley. The creek near Mr. S. Blackman's

residence is about the same altitude as Gulgong. On the 15th December I gauged the creek here, which owing to the late dry season was unusually low, and found the water flowing at the rate of 94 gallons per minute. This amount would be sufficient for a population of 4,000.

It would, however, be considerably diminished by going above the junction of Stony Creek, which would be necessary in order to obtain a supply by gravitation. The required amount of water will depend therefore not on the daily flow in the creek, but on the storage capacity of reservoirs in regard to a yearly supply.

The catchment area of this valley is no doubt large enough for the annual rainfall to be sufficient to fill all the reservoirs which would be required. It is therefore a question of survey to ascertain (1st) whether suitable sites for reservoirs can be obtained; and (2nd) whether the advantages to be gained by this gravitation scheme as regards cost of construction, &c., would be greater than those afforded by the scheme for pumping an equal supply of water from the "Wait-a-while" or from Cooyal Creek near the No. 44 claim.

In August I proceeded according to your direction to examine the limestone caverns near Cowra. My Report thereon you have received.

On my returning to Gulgong, I visited part of the Turon Gold Field and inspected and reported on certain mineral leases near Mitchell's Creek. The formation of that locality consists of Upper Silurian schists and sandstones with dykes and broad masses of porphyritic granite, elvanite, and greenstone. It is where these intrusive rocks appear that the gold-bearing reefs occur.

During my tour through the gold fields I travelled on duty 3,470 miles, inclusive of 350 miles by railway.

In some parts of the gold fields there are lands unsuitable for agriculture which, therefore will not be occupied for such purpose. Applications to purchase such lands at auction sale have been made by squatters and refused; as the lands embrace certain geological formations in which payable auriferous deposits are likely to be discovered, and so this ground which if improved by ringbarking, &c., might have been made available for grazing purposes, and thereby have greatly enhanced the capabilities of the adjacent pastoral estates, now remains unimproved.

This objection, however, might be removed if the land were sold by auction, subject to permission being granted to search thereon for gold, and for the resumption of the land by the Crown on its being proved payable auriferous.

That such lands should remain idle, perhaps for some twenty or thirty years, awaiting the discovery of the minerals they contain, is a circumstance to be avoided as much as possible; besides which, the occupation of the lands will, in my opinion, lead to the earlier development of its mineral resources. I beg therefore to suggest, for the consideration of the Honorable the Minister for Mines, the desirability of Legislative enactment to provide that all lands for auction sales within proclaimed gold fields open to conditional purchase, should be sold under the provisions of the 14th section of the "Crown Lands Alienation Act, 1861."

I have, &c.,

C. S. WILKINSON, L.S., F.G.S.,

Government Geological Surveyor.

APPENDIX.

DONATIONS to the Museum of Mines, Sydney, up to the end of December, 1876.

Name of Contributor.	Contributions.
Mr. J. B. North.....	Kerosene shale, Joadja Creek.
Mr. T. T. O. Atkinson, J.P.....	Iron ore, Berrima.
Mr. J. B. North.....	Auriferous quartz, Clarence District.
Mr. P. Dwyer.....	Auriferous specimens and petrified wood, Home Rule.
Mr. Smith.....	Asbestos, Lewis Ponds Creek, Wollington.
Mr. Fountain.....	Ferruginous specimens, Brisbane Water.
Mr. H. A. Thompson.....	Copper specimens, Goodrich.
Mr. E. A. Baker, M.P.....	Copper specimens, Melbourne Creek and Peelwood.
Mr. P. Arnold.....	Black sand, Tumbarumba.
Mr. H. Roman.....	Auriferous wash-dirt, Uralla.
Mr. Shepard.....	Black sand, Adelong.
Mr. J. De V. Lamb.....	Kerosene shale, Joadja Creek.
Captain Armstrong, R.N.....	Blue carbonate of copper, Wiseman's Creek.
Mr. C. Orchard.....	Copper specimens, Merimbula.
Mr. T. Brown, J.P.....	Copper specimens, Cloncurry, Queensland.
Do.....	Pisolitic limestone, Western District.
Mr. J. K. Hume.....	Collection of fossils, Goulburn District.
Do.....	Silurian fossils, Yass Plains.
Hon. Francis Lord.....	Noumeite (silicate of nickel), New Caledonia.
Mr. Alex. Steele.....	Garnierite (silicate of nickel), New Caledonia.
Mr. Copeland.....	Micaceous granite, Araluen.
Do.....	Auriferous quartz, Ironbarks, near Orange.
Do.....	Cassiterite, Cope's Creek.
Do.....	Auriferous quartz, Peel River.
Do.....	Quartz crystals, Peel River.
Mr. J. H. Clarke.....	Plumbago clay, Binda.
Do.....	Mispickel, Moruya.
Do.....	Micaceous iron, Southern District.
Do.....	Topaz, Bingera.
Mr. C. Bowler.....	Calcite, Cooma.
Mr. Alfred Cane.....	Asbestos, Carrangara.
Mr. A. Hordern.....	Asbestos, Italy.
Mr. Geo. Russell.....	Cerussite and copper ores, Peelwood.
Mr. L. S. Bensusan.....	Cinnabar, Cudgong.
Do.....	Crystalline, sulphide of tin, and grain tin, Kangaroo Tin Works.
Do.....	Specimens of Colonial marble.
Mr. O'Brien.....	Scoria and pumice stone, Bondi.
Professor Liversidge.....	Calcareous concretions and petrified wood, Greta.
Mr. Biggar.....	Pleurotomaria, pachydomus, and spirifers, Wollongong.
Mr. R. D. Fitzgerald.....	Calcareous coating on sandstone, Picton.
Mr. Beattie.....	Stanniferous specimens, Deepwater.
Mr. Clements.....	Arragonite, petrified wood, fossils, &c., Liverpool Plains.
Mr. J. Jackson.....	Lode tin, Mole Table Land.
Mr. C. Worth.....	Glossopteris, &c., Kerrabee, County Phillip.
Mr. Wilson.....	Petrified wood, &c., Broughton Creek.
Mr. A. C. Cruttwell.....	European fossils.
Mr. Baldock.....	Arsenical pyrites, Wattle Flat.
Mr. J. Hawkins.....	Molybdenite, Stanthorpe.
Gympie School of Mines.....	Collection of Mineralogical specimens, Queensland.
Mr. Campbell.....	Collection of specimens, Monaro District.
Mr. Gipps.....	Geological specimens, Talbragar River.
Mr. Wm. Capewell.....	Fossil nuts, Black Lead, Gulgong.

Name of Contributor.	Contributions.
Mr. Wilson Quinn.....	Fossil fruits, Black Lead, Gulgong.
Mr. F. Cross	Fossil fruits, Home Rule.
Messrs. T. Moss and G. Honeyforth	Fossil fruits, Home Rule.
Mr. Jamieson	Copper ore containing gold, Fitty's Reef, Mitchell's Creek.
Mr. W. Craigen	Copper ore, Goodrich Mine.
Mr. Farr	Fossil nuts, Gulgong.
Mr. T. E. Mitchell.....	Auriferous quartz, Bonnie Dundee Reef, Parkes.
Mr. Veal	Iron pyrites and wood tin, Grenfell.
Mr. Hamilton.....	Iron pyrites, Gulgong.
Messrs. P. Ward, W. Whelan, C. Doyle, F. Marshal, J. M'Gee, W. Sex, and W. Quinn.	Fossil fruit, Gulgong.
Mr. S. Blackman, J.P.	Rock crystal, tin ore, &c., Cooyall Station.
Mr. Murphy	Petrified wood and fossil bone, Gulgong.
Messrs. G. Willacy, W. Powell, Jas. Cooling, and J. Palmer.	Copper ores, lode 12 miles N.W. of Parkes.
Mr. O. Cunningham	Fossil wood from Two-mile, near Grenfell.
Messrs. Mitchell and Stinson	Auriferous quartz, Grenfell.
Mr. C. B. Lowe, J.P., Goree Station	Silicified wood, some opalized, polished pebbles, and topaz from Pliocene drift, Two-mile Flat, near Gulgong; opalized wood, Pliocene drift, Home Rule; crystals of quartz embedded in felspar, Home Rule; and Carboniferous fossils, Bylong.
Messrs. Winter and Morgan.....	Sulphide of copper, lead, zinc, and silver, auriferous quartz, Sunny Corner, Mitchell's Creek.
Mr. Robert M'Kay	Gold in cement, Carboniferous conglomerate, associated with glossopteris beds, Clough's Gully, Tallawang.
Mr. J. C. F. Rotenberg	Fossil wood and ironstone, Clough's Gully, Tallawang.
Mr. Andrew Epple	Fossil nuts and unio shell, Home Rule.
Mr. C. Smith	Copper pyrites in quartz, Hargraves.
Mr. Bothery	Copper ore, Clifton Station, near Carcoar.
Mr. Robt. Kennedy	Copper ore, Clifton Station, near Carcoar.
Mr. J. Gardner	Copper ore, Belara.
Lt.-Col. Goodlett	Fire-clay containing unio, Botany Road.
Mr. M. Doyle.....	Aerolite and lode tin, Bingera.
Mr. Daniels.....	Sulphide of copper, Merrimbula.
Mr. G. A. Florice.....	Alum, &c., Mount Wingen.
Do.	Kaolin, petrified wood, and opal, Queensland.
Dr. Barnard	Carbonates of bismuth, New England.
Mr. Muston	Alum and lode tin, Mount Wingen.
Mr. Blackett	Productus and conularia, Mount Wingen.
Mr. A. Stephen	Water-stone, Home Rule.
Messrs. Rouse and Jamieson	Gold in copper ore, Mitchell's Creek.
Mr. F. Doile	Diamond drift, Cudgegong River.
Mr. W. P. Simpson, L.S.	Hematite, Wellington.
Mr. A. D. Shepard	Auriferous specimens, Nundle.
Mr. J. Sharpe, L.S.	Collection of mineralogical and geological specimens.
Mr. Plunkett	Diamond sand, Cudgegong River.

DESCRIPTIVE NOTES ON THE TERTIARY FLORA OF NEW SOUTH WALES:

BY BARON FERD. VON MÜELLER, C.M.G., M. & PH. D., F.R.S.

[Vegetable Fossils of the Upper Pliocene age, discovered at Gulgong by C. S. WILKINSON, L.S., F.G.S., Government Geologist; and described by Baron Ferd. von Müller, C.M.G., M.D., F.R.S.]

OCHTHODOCARYON—F. VON MÜELLER

Fruit large, globular or verging into an ovate form, sometimes compressed, one-celled, indehiscent, closely verrucular outside, almost smooth inside: pericarp woody, almost bony, of considerable thickness. Septa, none. Seeds unknown.

This genus approaches in warty roughness and somewhat reticular outer plicatures of the pericarp to Phymatocaryon; but the valveless structure brings it much nearer to Plesiocapparis. It may indeed merely form a section of that genus, but the pericarp is harder, and also deeply wrinkled, by which means the fruit assumes a very different aspect. The absence of seeds forbids to trace farther any affinity to Plesiocapparis, and likewise prevents to fix the ordinal position of this fossil. There is great external resemblance to Xylocaryon, but the cavity of the fruit shows no traces of any ridges, interponent to the lobes of a large seed.

OCHTHODOCARYON—WILKINSONII.

Two specimens only of this fossil were obtained, each representing a somewhat peculiar form; the one spherical and of nearly 2 inches measurement; the other roundish, oval, and compressed, measuring $1\frac{1}{2}$ inch.

EISOTHECARYON—F. VON MÜELLER.

Fruit, rather small, bony, globular, slightly depressed or compressed, faintly wrinkled outside, indehiscent, or, towards the summit, bivalvular. Septum intruding longitudinally, and from one side only into the cavity, reaching the middle of the fruit, flat towards the wall, but turgid towards the centre of the cavity. Seed unknown.

I have preferred placing into a new genus, to regarding it merely as a species of the genus Villaresia of the living creation, although the existence of two Villaresia in Eastern Australia at the present day strengthens much the assumption of its being represented there also at the Pliocene period. If, however, the view held by many should be adopted also in this instance, that the congruency of merely one organ of a fossil plant with that of a living one ought to suffice for establishing generic identity, then this new fossil would find its systematic location in Villaresia.

EISOTHECARYON SEMISEPTATUM.

Fruit measuring from nearly $\frac{1}{2}$ an inch to $\frac{3}{4}$ inch, possibly soft in a fresh state, oftener blunt than pointed at the apex; the turgid portion of the septum somewhat hollow along its centre. Seed unknown, but in all probability curved around the dissepiment.

ILLICITES—F. VON MÜELLER.

Fruit, starlike, expanded, consisting of eight carpels; these radiating in one series, connate towards their oval base, thence free and gradually pointed, rather flat at the lower side, very convex on the upper side, there longitudinally dehiscent; also lengthwise wrinkled and streaked as well as slightly tubercular; vertex of the axis excavated. Seeds unknown.

So far as the material for examination extends it might induce us to place this organic relic into the genus *Illicium* of the living vegetation; but as nowhere else any species of that genus has as yet been found in a fossil state it was deemed safer, in accordance with palæontographic usage, to frame a separate generic type of similar wording for the fossil probably allied plant. Flowers and foliage as well as perfect seeds would also be needed to establish this fossil an undisputed position in *Illicium*. As an addition to the magnoliaceæ of past geologic periods this plant is of particular interest, fossil remnants only of the genera *Magnolia* and *Liriodendron* being hitherto from this order on record, these again mainly of the Cretaceous epoch, and indeed doubtful in many instances, being often described from leaves merely.

ILLICITES ASTROCARPA.

The only fruit seen about half as large as that of *Illicium anisatum*, the carpels also more acutely attenuated. It differs from *Illicium Floridanum*, if a comparison is at all admissible, likewise in small fruitlets of lesser number, not suddenly beaked, while from both it is readily separated by the fruit being convex on the upper not on the lower side, and by its not being smooth.

PENTACOILA—F. VON MÜELLER.

Fruit bony, compressed globular, indehiscent, slightly rough outside, five-celled. Seed solitary in each cell, oval, compressed.

This genus ought probably to be placed near *Penteune*, notwithstanding its want of valvular dehiscence.

PENTACOILA GULGONGENSIS.

Fruit somewhat less than an inch in length, so far as can be judged from the only specimen hitherto obtained. Cavities rather narrow, smooth.

PLEIACRON—F. VON MÜELLER.

Fruit small, bony, ovate, smooth truncate at the summit, terminated into four or six tooth-like short protrusions, quite indehiscent, four to six celled. Seeds solitary in each cell, clavate-ellipsoid; the narrow end upwards.

PLEIACRON ELACHOCÁRPUM.

Fruit only about $\frac{1}{2}$ inch long, according to a solitary specimen; the impression of the summit shallow, teeth four, almost blunt; a short perforation at the base; cells four, stretching along nearly the whole length of the fruit. Perfect seeds not seen, nor their mode of attachment as yet ascertained.

The collection contains a similar somewhat larger fruit with six cells and six terminated teeth; this fruit is provided with a short and very thin stalklet. If it belongs also to *P. elachocarpan*, then the characteristic of the latter needs modification.

ACROCOILA—F. VON MÜELLER.

Fruit rather small, bony, broadly ovate, smooth, at the summit truncate, terminated by a shallow depression and the entire circular margin of the calyx-tube, one-celled. Seed unknown.

Externally this fruit bears much resemblance to that of some baccate myrtaceæ, but it cannot even be proved yet whether this plant belonged to that order, although it evidently pertains to one of the families of calycifloræ.

ACROCOILA ANODONTA.

Fruit rather less than $\frac{1}{4}$ inch long, not dotted. Pericarp at an average barely of $\frac{1}{4}$ line thickness. Placentation unknown.

PHYMATOCARYON BIVALVE.

Fruit roundish, much compressed, bivalved, two-celled, blunt or slightly protracted at the apex, almost smooth or but slightly tubercular outside, the valves diverging from near the base; one of the cells only seed bearing; seed more than half as long as the valves.

Closely allied to *P. angulare*, though probably not a mere variety; the valves not three in number and more acute at the edge.

As long as we remain unacquainted with the foliage and flowers of the plants which yielded these fruits, it will be most convenient to treat them as if they belonged to one genus. In this we are all the more justified, because in the living vegetation a similar variability of the number of fruit valves is demonstrated by many genera, a familiar instance being that of *Pittosporum*, the valves of which in different species vary from two to five. Evidently no sarcocarp existed in *P. Angulare* and bivalve, nor has such been seen in any of the numerous specimens of *P. Mackayi*, which more latterly came under review. Of a valvular putamen, however, within a sarcocarp, the genus *Inglans* furnishes a well-known example.

PLESIOCAPPARIS LEPTOCELYPHIS.

Fruit comparatively small, globular, more or less compressed, slightly oblique; pericarp very thin, outside smooth; seeds almost oval or roundish, somewhat curved, at least on one side smooth, with a short perhaps strophiolar or radicular protrusion.

Clear evidence is wanting for the generic position of the plant yielding this fruit. Should future researches establish it as a separate genus, then the specific name above given might be adopted for the genus.

Length of the whole fruit, from about 1 inch to nearly $1\frac{1}{4}$ inch. Thickness of pericarp, about $\frac{1}{4}$ line or not much more. Seeds $\frac{1}{4}$ – $\frac{1}{2}$ inch long.

SPONDYLOSTROBUS SMYTHII.—VAR. CRYPTAXIS.

Valves longer than the axillary body or nearly as long, the latter concealed by them; narrow interstices only, or none between the valves.

Melbourne, October, 1876.

REPORT UPON MINERAL AND OTHER SPECIMENS EXAMINED FOR THE MINING DEPARTMENT, DURING THE YEAR 1876.

By PROFESSOR LIVERSIDGE, F.C.S., F.G.S., etc., of the Sydney University.

March 19, 1877.

Sample No. 129.

CHROME IRON ORE—Woolomi, Tamworth. A specimen of the massive variety of chromite or chromate of iron; colour black, lustre dull metallic. On certain portions the specimen exhibits curved, somewhat fluted, polished surfaces, closely resembling the smooth and lustrous surface of a *Slickenside**. It may not be out of place to mention that this resemblance to a slickenside is not at all uncommon in many compact clay deposits, in steatite, serpentine, and other rocks; it is also often well shown in many specimens of the mineral noumeite.

To distinguish this structure from the true slickenside, I have ventured to propose the term *petaloidal*, from the resemblance which the typical examples of such surfaces bear to the curved and fluted petals of an unopened flower-bud.

On analysis the sample was found to be a rich chrome iron ore instead of a simple iron ore, for which it was mistaken by the finder, thus,—

Chromium sesquioxide...	...	...	64.72 per cent.
Iron protoxide ...	...	...	21.11 „

Sample No. 130—Marshall M' Mahon Reef, Jugiong.

A GREY COLOURED AURIFEROUS VEIN STUFF, containing some arsenical pyrites—

Gold...	...	...	0 ozs. 13 dwts. 17 grains per ton.
Silver	...	...	0 „ 9 „ 17 „

Sample No. 131—No Locality given.

A mixture of IRON PYRITES AND GALENA with a trace of copper pyrites; the galena is finely granular—

Gold...	...	...	0 ozs. 3 dwts. 22 grains per ton.
Silver	...	...	8 „ 3 „ 8 „

Sample No. 132—Parkes District.

Locality, 18 miles north-west of Gobandry. AURIFEROUS QUARTZ, tough, and of a dull brown colour; associated with a little brown iron ore, malachite, chalcedony, and opal—

Gold...	...	...	2 ozs. 7 dwts. 16 grains per ton.
Free gold	...	...	2 „ 1 „ 19 „
Total gold	...	...	4 „ 9 „ 11 „
Silver	...	...	0 „ 4 „ 12 „

Sample No. 133—Parkes.

MAGNETITE OR MAGNETIC OXIDE OF IRON, diffused in gneissiform layers through white vein quartz. This sample was forwarded for examination as an ore of antimony, being an iron ore instead; an analysis was considered unnecessary.

* A *Slickenside* is the smooth polished and striated surface occasionally exhibited by the walls of faults and slides, in such cases, however, the peculiar structure has undoubtedly been induced by friction aided by intense pressure.

Sample No. 134—Water from Winter's Gold Mine, Mitchell's Creek, head of the Turon River.

This sample of water (which was contained in four wine bottles) was collected by Mr Wilkinson F.G.S., the Government Geologist, in order that it might be examined for the presence of gold in solution.

The water was slightly turbid, but in other respects its appearance was quite normal, neither did it exhibit any reaction with test papers, *i.e.*, it was neutral in its reaction.

The sample was filtered and the filtrate evaporated to dryness and examined for gold; but with the greatest precaution to avoid loss and with the most delicate tests no indications of the precious metal could be obtained. Gold was however found in minute quantity in the solid matter left on the filter.

Although no gold was found in solution in this instance I do not think that the evidence can be considered as at all conclusive, for the quantity of water submitted to me for examination was insufficient for the purpose; to determine the question satisfactorily it would be necessary to operate upon many gallons of such mine water.

Sample No. 135—Weatherboard, Blue Mountains.

COAL.—Bright, and of very fair appearance.

							Analysis
Hygroscopic moisture	...	...	...	...	...	...	2.04
Volatile matter	...	...	...	...	...	...	24.10
Sulphur	...	...	...	...	...	...	.42
Fixed carbon	...	...	...	...	...	...	51.53
Ash	...	...	...	...	...	...	21.89
							<hr/>
							99.98

Specific gravity, 1.384.

Coke.—Rather dull and tender; not of good quality. Percentage of coke, 73.42.

Ash.—Light grey.

Remarks.—The proportion of ash contained in this coal is considerably larger than that in the Lithgow Valley coal (see Report, 1875, p. 134), the latter having 10.12 per cent. of ash. The percentage of sulphur, however, in this specimen from the Weatherboard is much less; the Lithgow Valley specimen giving 1.41 per cent.

Sample No. 136—Weatherboard, Blue Mountains.

COAL.—Labelled :—from thin seam. A dull, compact coal, somewhat stained with oxide of iron.

							Analysis
Hygroscopic moisture	...	...	...	...	...	...	8.56
Volatile matter	...	...	...	...	...	...	29.01
Sulphur	...	...	...	...	...	...	.26
Fixed carbon	...	...	...	...	...	...	38.07
Ash	...	...	...	...	...	...	24.08
							<hr/>
							99.98

Specific gravity, 1.432.

Coke.—None. The coal does not cake; a black powder only is left.

Ash.—Brilliant white.

Remarks.—This coal is of but poor quality, and the sample appears to have been taken from the outcrop.

Sample No. 137—Weatherboard, Blue Mountains.

COAL.—A fairly bright coal, made up of rather thin laminae; the bright layers are tender, somewhat stained with oxide of iron.

Specific gravity, 1·438.

	Analysis.
Hygroscopic moisture	2·53
Volatile matter	27·76
Sulphur	·32
Fixed carbon	50·80
Ash	18·58
	<hr/>
	99·99

Coke.—Of very fair hardness and lustre, well swollen up.

Ash.—Grey.

Remarks.—This sample, in common with No. 136, has the appearance of being an out-crop specimen.

No. 138—Mudgee.

CARBONACEOUS EARTH.—A black, earthy, friable material from near Mudgee; soils the fingers readily. In parts it is grey in colour, and here and there an occasional white streak is seen; falls to powder when immersed in water.

Specific gravity, 2·88.

	Analysis.
Hygroscopic moisture	1·60
Combined water (by difference)	13·38
Silica	46·00
Alumina	32·32
Lime	Absent
Magnesia	"
Potash	·17
Soda	·13
Carbon... ..	6·40
	<hr/>
	100·00

The mineral, as shown by the above analysis, is essentially a hydrous silicate of aluminium mixed with a small proportion of carbonaceous matter. The carbonaceous matter is readily burnt off.

As a fire-clay this material would not be of any great value, since it only possesses average refractory qualities. It should be remarked that it is totally distinct from graphite, the mineral for which it is often mistaken by miners.

Sample No. 139—Cardiff Mine, Newcastle District.

COAL.—A bright, firm, and compact looking anthracitic coal, when struck emits a clear ringing sound very unlike the dull sound given out by soft and friable varieties of coal.

Breaks with a somewhat splintery and conchoidal fracture across the joints and planes of stratification.

Tough, and does not yield readily to pressure.

Does not soil the fingers; no mother-of-coal or mineral charcoal observed. When ignited decrepitates somewhat, and burns with but a small amount of flame.

A few scattered grains of pyrites were observed in the sample, but the total amount of sulphur present, as shewn by the following statement of per centage composition, is below the average.

Proximate Analysis.

Hygroscopic moisture	...	...	...	...	...	1.853
Volatile matter	...	...	...	...	...	43.354
Sulphur	...	...	...	...	...	.348
Fixed carbon...	...	...	...	...	...	49.486
Ash	...	...	...	...	...	4.944
						<hr/> 99.985

Coke.—54.430 per cent., bright in lustre and fairly well swollen up, but rather tender.

Ash.—Grey, loose; contains traces of copper.

Ultimate Analysis.

Carbon	...	...	...	...	...	80.727
Hydrogen	...	...	...	...	...	4.303
Oxygen	...	...	...	...	...	6.816
Nitrogen	...	...	...	...	...	1.009
Sulphur	...	...	...	...	...	.348
Ash	...	...	...	...	...	4.944
Hygroscopic moisture	...	...	...	...	...	1.853
						<hr/> 100.000

Specific gravity, 1.286.

Remarks.—Judging from the chemical analysis and firmness of this sample of coal it should be particularly well adapted for steam and certain metallurgical purposes.

